



Program Review Self Study

Center for Digital Arts and Experimental Media (DXARTS)

College of Arts & Sciences, University of Washington, Seattle

Degrees offered: PhD and Minor in Digital Arts and Experimental Media.

Last Review: 2007-2008

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Introduction

Dear members of the Program Review Committee,
it is with pleasure that I submit this Program Review Self Study. This document has been organized following the format requirements of the UW Graduate School. Given space constraints, a fair amount of information has been placed in the appendices or in online documents, please follow the provided links. You are also encouraged to visit the DXARTS website (dxarts.washington.edu) for detailed information about our faculty, staff and students, documentation of many of their research projects, as well as in depth descriptions of our programs and facilities. I hope you enjoy reading this document and please don't hesitate to contact me in case you have any questions.

Sincerely,
Prof. Juan Pampin
Director, DXARTS
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Part A: Required Background Information

Section I: Overview of DXARTS

Mission & Organizational Structure

The commitment to the distinctive strengths of DXARTS is captured in the unit's mission statement. The central strength of DXARTS comes from the creative convergence of dedicated Digital Arts faculty from the visual and performing arts. The broad matrix of interrelated research activity provides the foundation and serves as a central feature in the creation of the new and emerging technology-based art forms that are invented in DXARTS. The collected rich perspectives and resources are uniquely organized in DXARTS towards individual artistic vision, collaborative creative practice, advanced technology research and development, and critical scholarship. The program's main goals are designed:

- To harness the creative interactions among the faculty and their unique disciplines and serve the campus as an incubator for innovative research, education, artistic production, community and industry collaboration.
- To challenge basic assumptions about art and art practice, dissolve boundaries between disciplines in order to invigorate and intensify innovation and further question distinctions such as notions of art object and apparatus, theatrical performance and experiment, artist as author and audience as passive viewer.
- To develop sophisticated research, teaching methods and new technical means that promote the advancement of theory and generative practice necessary for continued growth and invention, and pursue a broad range of scholarly investigations that explore emerging philosophical and scientific issues in Digital and Experimental Arts.
- To generate a pool of expert digital and experimental artists who work with the utmost technical sophistication, intellectual rigor, and artistic virtuosity in a rapidly emerging field
- To give digital artists the opportunity and equitable institutional support to attain the equivalent level of intellectual and professional achievement at the culmination of their graduate studies as their peers and partners in all areas of the Humanities, the Sciences, Engineering, and in the allied generative arts field of Music Composition and Computer Music, for which doctoral degrees are the normative terminal degree for graduate students.

- To support the University of Washington, other universities that are on similar paths, and still others that will follow our lead, to demand of Digital Arts students a new level of rigorous and original research and creative work by the final stages of their graduate studies and in all steps leading towards the conferral of the PhD degree.
- To expect our graduates to create individual and significant artistic visions, a broad range of practical experience, and a body of substantial work they will need to prepare them for leadership roles in pioneering the new artistic and technical advances of the 21st century.
- To establish the University of Washington as one of the world's leading institutions for the creation and study of new forms of Digital Art and Culture.

Graduate and Undergraduate degrees

DXARTS offers a PhD and a Minor in Digital Arts and Experimental Media. Until 2013 DXARTS also offered a Bachelor in Fine Arts in Digital Arts and Experimental Media.¹ Appendix C shows enrollment and graduation patterns for each of these degrees.

Program Governance and Administrative Structure

Though DXARTS not only works closely with its participating units, creating bridges between the Center and those units and also between the different participating units themselves, the program is still fully independent and autonomous in its administration and governance and reports to the Dean of the College of Arts and Sciences. The Director attends the meetings of Arts Directors called by the Divisional Dean for the Arts and all-college chairs meetings called by the Dean of Arts and Sciences. DXARTS is organized in the following way:

1) Director and Faculty: The Director of DXARTS (currently Professor Juan Pampin) is appointed by the Dean of the College of Arts and Sciences, and also as the Doctoral Program Director. The DXARTS Faculty, chaired by the Director, meet regularly (at least once per month) to review and advise on requirements and procedures for the program.

2) Core Faculty: A core group faculty, have primary responsibility for the development and teaching of the curriculum, for making admission decisions, and for the advising and supervision of PhD students. Core faculty enact the following:

¹ A moratorium of admissions to our BFA program was put in place in the 2012-2013 academic year. A copy of the memo presented to Dean Bob Stacey requesting the initiation of the RCEP process to terminate our BFA program has been uploaded to the Graduate School online drive. This memo presents the rationale behind this decision which was taken with the support of the faculty and the deans. The RCEP process was completed in 2015 (the notification from the Secretary of the Faculty has also been uploaded to the online drive).

- New Course Proposals and Course Changes
- Degree Program Proposals and Degree Program Changes
- Acceptance of PhD Students
- Selection of new members of the Core Faculty

3) Adjunct Faculty: a secondary group of Adjunct Faculty contribute to the program in a variety of ways including teaching DXARTS courses whenever possible, advising on curriculum and research issues, and serving on PhD Supervisory Committees.

4) Research Associates: in addition to the Core and Adjunct Faculty, the program funds two 100% FTE Research Associates. These rotating positions provide important additional research resources while bringing emerging and mature artists and scholars with different areas of expertise into the program on a regular basis.

5) Staff: The Program has the support of four full-time staff:

- Our Administrator, Billie Grace, manages the day-to-day operations of the program including budgets, purchasing, and many other management details. She also takes care of advising for our graduate students and minors and acts as our Graduate Program Coordinator.
- Three Research Scientists provide research support and oversee the computing, technology, and facilities. These are arts-technology specialists who provide expert advice and support to faculty and graduate student research projects. They are also in charge of the technical production for our concerts and installations, and take care of the maintenance of our equipment and labs.²

6) Senior Lead TA: the Program chooses a doctoral student to serve as Senior Lead TA. The student in this position holds meetings with the graduate students every month and regularly meets with the Director to discuss students concerns and suggestions.³

7) Graduate Students: the program has funding to support graduate students in positions as Teaching Assistants, Research Assistants and Graduate Staff Assistants. As an important part of each student's education and training involves teaching, laboratory and studio staff work. Students are consulted about facilities policies and equipment purchases, in fact, many of the STF grants awarded to DXARTS were proposed by our PhD students.

Appendix A shows an organizational chart of DXARTS.

² For a full list of our staff and more information about their research roles please visit: <https://dxarts.washington.edu/people/staff>

³ Martin Jarmick is our current Senior Lead TA.

Budget & Resources

DXARTS is extremely resourceful, our center has a budget that is a fraction of most of our competitors' budgets. Many of these programs also have faculty and staff that at least double ours in number. Despite this disparity of resources we still are competitive and get the best students to come to our PhD program and manage to hire the best international faculty. This has to do with who we are and the way we use our resources, how much we invest in faculty and student research, and with our smart investment on equipment and facilities. This resourcefulness also helps us to be flexible and nimble and to adapt to critical budgetary situations. But resourcefulness has a limit, and we are reaching it, we believe any further loss of faculty, staff or resources could be terminal for DXARTS, as we are already running our program with what former Divisional Dean Betsy Cooper called a "skeleton crew".

DXARTS has already experienced severe budget cuts in the last ten years, they could be summarized as follows:

- We lost a junior faculty position when Stephanie Andrews left the UW in the midst of the 2009 economic crisis and the university was under a state-mandated hiring freeze. Later, we lost a senior faculty position when Shawn Brixey left the UW in June 2013. Of these two faculty positions we only recovered the junior faculty one, when Afroditi Psarra was hired last year, but the funding from Brixey's position (\$90K) has gone back to the Dean's office⁴.
- The cost of Academic Student Employees (ASEs) has increased by about 30% in the last few years after the ASEs unionized. This increasing cost has been gradually absorbed by DXARTS, as the College has not provided additional funds to cover these increases and at the same time has decreased its Temporary Instructional Funds (TIF) allocations by almost 50% every year.
- The cost of our off-campus facilities has gone up significantly in the last ten years, it currently represents about 10% of our GOF budget (around \$100K a year). Beside the rental costs, DXARTS also has to pay for all the utilities, internet, and security costs of this space. This could be considered an indirect budget cut, as DXARTS is the only art unit that rents space for its operations. It is important to note that funds for our off-campus facilities came from a Visiting Artist position that was part of DXARTS UIF budget, those funds (about \$55K) could only cover about 50% of the current costs.

Our budgetary situation is even more dire if we consider that Dean Bob Stacey has recently announced a 1.5% to 2% budget cut for all units to be in effect in fiscal year 2018. As mentioned

⁴ These funds were used to pay for a temporary Visiting Associate Professor position for two years in 2013-2015.

before, DXARTS has adapted to adverse budgetary situations in the past by taking some important decisions: it has reduced its staff closing CARTAH⁵ in 2011 and eliminating its associated 100% FTE staff position; later our 100% FTE undergraduate adviser position was eliminated when Cynthia Caci moved to the Dean's office and we decided to terminate our BFA program. More recently, we eliminated our Ballard lab manager position, another 100% FTE staff position. Our current staff is down to three technicians and our faculty is down to four, with two of these faculty members serving in important administrative positions (Prof. Richard Karpen is the Director of the School of Music and Prof. Juan Pampin is the director of DXARTS).

In 2017 DXARTS received a budget allocation from College of \$1,135,868,⁶ about 90% of these funds goes to pay the salaries of faculty, staff, ASEs, and hourly employees. The funds that are left (about 10%) are just enough to cover our Ballard costs. This leaves us with no funds to keep our equipment and facilities up to date, that's why we resort to Lab Fees for classroom and lab software and hardware purchases, as well as for equipment maintenance; and to Student Tech Fee (STF) grants, for purchasing expensive pieces of equipment, which in average come up to about \$50K yearly. In the current biennium DXARTS also got \$80K from a grant from the National Endowment for the Arts for ongoing music and brain research at our Art+Brain lab. Adding all these extra resources—plus faculty endowed professorships and other income to support faculty research—is what allows us to continue operating at the level of excellence characteristic of DXARTS. But any further cuts (or even changes in the STF rules or Lab Fees caps, or the culmination of these endowed professorships) could make it impossible for us to continue operating at this level of excellence.

Appendix B presents an overview of the DXARTS budget of the last three bienniums.

Advancement Efforts

DXARTS works closely with the Advancement staff of the College of Arts and Sciences. Stephanie Kornfeld is the person in charge of our advancement efforts at the Dean's office. Below is a brief description she has provided of our top fundraising priorities:

1. Discovery efforts for DXARTS: fundraising for our young program is at a discovery stage which means that a selected group of potential donors has been identified and invited to several events organized by DXARTS. In these events, potential donors get exposed to our work and

⁵ The Center for Advanced Research Technology in the Arts and Humanities (CARTAH) was a predecessor of DXARTS which served both Arts and Humanities faculty and students. CARTAH was later absorbed by DXARTS which continued to offer its digital humanities services until 2011.

⁶ It should be noted here that \$700,000 of this budget come from the DXARTS UIF grant. This means that the actual College allocation for 2017 is \$417,189. These numbers are not the ones used to calculate the percentages used in the last paragraph of the program review charge letter: "The College currently subsidizes 80% of the budget of DXARTS, with the remaining 20% coming from revenue generated by student credit hours." This statement is actually not accurate, with the actual allocation DXARTS subsidy would be actually 47%.

get introduced to our faculty and graduate students. Below is a list of the most important development events from the last few years:

- 3D printing Arts Pass event at Fremont FabLab (March 21, 2013). This event included a presentation by DXARTS Director Juan Pampin, a tour of our off-campus facilities, as well as a hands-on tutorial of 3D scanning and printing.
- *Sanctum* Arts Pass event (June 13, 2013). This event included a dinner with potential donors and a tour of the *Sanctum* installation at the Henry Art Gallery lead by Professors James Coupe and Juan Pampin
- Don Bergstrom tour of *Sanctum* (June 24, 2013). DXARTS Professors James Coupe and Juan Pampin gave College donor Don Bergstrom a special tour of their *Sanctum* installation followed by a tour of our on-campus facilities at Raitt Hall. It should be noted that Mr. Bergstrom decided to provide the College with the endowed funds for the Bergstrom Award for Art & Science shortly after this visit.
- Arts Pass Spring Concert lunch (April 17, 2014). A lunch was followed by an on-stage demo of live electronics performance at Meany Hall. A selected group of potential donors were also invited to the dress rehearsal for the evening show.
- Arts + Science Dean's Club event at the Burke Museum (June 4, 2014). DXARTS PhD student Robert Twomey was profiled at this event in which DXARTS had a dedicated booth presenting documentation of faculty and students research.
- Adventures in 3D sound Arts Pass event (May 28, 2015). This event included a presentation by DXARTS faculty and staff whose research is related to 3D audio, a tour of our on-campus facilities at Raitt Hall including listening sessions and a hands-on tutorial of Ambisonics recording and reproduction.
- Don Bergstrom tour of Ballard (November 29, 2016). A special tour of our off-campus facilities was given to Mr. Bergstrom during which he was introduced to our new faculty member Afroditi Psarra.
- College of Arts & Sciences Advisory Board meeting (September 14, 2016). At this meeting Professor Richard Karpen introduced research in music and neuroscience performed at DXARTS' Art + Brain Lab. After this meeting board member Eddie Pasatiempo approached us requesting more information about this work and DXARTS in general.
- School of Music Friends of Music meeting (May 11, 2017). DXARTS hosted this meeting to introduce members of the School of Music advisory board to research in music and neuroscience performed at DXARTS' Art + Brain Lab.

- Spring Concert Arts Pass dinner (April 6, 2017). Dinner lead by Divisional Dean of the Arts Catherine Cole with a group of prospective DXARTS donors, including Don Bergstrom and Eddie Pasatiempo, after our Spring Concert at Meany Hall. DXARTS Professors Richard Karpen, Juan Pampin and Thomas Deuel as well as Profesor Emeritus Stuart Dempster were part of this event.

The relatively short life of our graduate and undergraduate programs makes it hard to rely on donations from alumni, especially within the first ten years after their graduation. We are currently at the point in which many of our alumni have held stable jobs for enough years which could open the door for possible gifts to the program. Part of our current fundraising plans is to make an annual appeal to former graduate and undergraduate students. Of these, we have already identified a list of prospective donors which will receive an special appeal note from the DXARTS Director.

2. Term and endowed visiting artists, lecturers, and professorships: DXARTS original budget included funds for visiting artists and lecturers. Those funds have been used for pay for the costs of our off-campus facilities which have increased significantly over the years. Part of our fundraising efforts will be dedicated to re-establish these funds via an endowment. We also envision establishing endowed professorships to support faculty research.

3. Graduate Fellowships: the increasing costs of ASE positions has forced us to reduce the number of students we admit to the our PhD program every year. Our plan is to establish endowed fellowships to support our graduate students covering at least a year of their PhD.

Diversity

DXARTS recognizes the importance of role models among the faculty in recruiting and retaining a diverse student and staff population as well as enriching the intellectual life and quality of its program. We view the issue of diversity holistically, flowing through every area and level of our program including graduate students, faculty, staff, and other affiliates. We believe that enhancing diversity within the faculty is an essential part of any serious plan to increase diversity throughout the population at a university, this is a high priority and is reflected in our most recent faculty hire. We are also especially sensitive to the unique challenges and barriers encountered by women in high-technology fields. This is an issue that impacts Digital and Experimental Arts, a field that requires deep and broad knowledge of science and technology along with the central artistic knowledge that all of our researchers and practitioners must acquire. Thus, we have made special efforts to recruit women into our program as faculty, students and staff. We are pleased to have been able to achieve a near 50/50 gender parity ratio in our doctoral program cohort. We have recently conducted a successful search and hired, Afroditi Psarra who started teaching in DXARTS in the Fall of 2016. Afroditi's appointment has been critical for re-establishing the gender balance lost after the departure of Stephanie Andrews in 2009. Afroditi came to DXARTS from Athens, Greece, with an extensive experience

of working with wearable technologies and e-textiles, an emerging field with a significant number of international female practitioners. In terms of our staff, we believe it is crucial to have women in key technical positions. After a staff reorganization in 2012 we have hired Ewa Trebacz as Research Scientist. One of our PhD alumna, Ewa takes care of our Raitt Hall facilities and equipment, for which she has programmed an online catalog and reservation system. With Ewa and our Administrator Billie Grace, our staff currently has a 50/50 gender parity ratio.⁷

Section II: Teaching & Learning

Teaching in DXARTS

Teaching in DXARTS is inextricably bound in research practice, it connects us intimately with other disciplines in ways many other arts and sciences units cannot, and it keeps the program vital by fueling the invention of many new interdisciplinary areas in which we work and pioneer. Teaching uniquely opens DXARTS up to a constant flow of campus collaborators beyond those the faculty are directly engaged with because in many disciplines most advanced research is siloed in departments and only available to their graduate students or majors. By designing our courses to be completely open to non-DXARTS students, we effectively import new methods, thought processes, creative practices and tools into DXARTS, while simultaneously exporting the ingenuity and creative wealth of our program and its interdisciplinary practice to the campus' central research core. This makes teaching in DXARTS not just a service to students but a vital transformative research practice that is a hallmark of the program.

DXARTS faculty have a teaching load of five courses a year which range from introductory classes to advance research seminars.⁸

DXARTS Curriculum

The DXARTS curriculum is organized in three main tracks Video (45x courses), Sound (46x courses) and Mechatronics (47x), where x designates the course level: zero for Introductory Classes and one or two for Advanced Classes. All DXARTS courses are open to all students at the UW, undergraduates and graduates. DXARTS courses usually fill up very quickly with long waiting lists, students need to apply to them online and obtain an add code enroll. In the last few years we have increased the capacity of our studio classes from 12 to 20 students to try to accommodate as many students as possible.

⁷ In the near future we expect to achieve a similar gender balance among our faculty.

⁸ Appendix D has a graph showing the number of students that took DXARTS classes from 2011 to 2017 organized by major.

All DXARTS courses are assessed through the Office of Educational Assessment, on top of these qualitative and quantitative evaluations, instructors receive peer reviews from other members of the faculty. These peer evaluations are conducted at least once a year for Assistant Professors and every other year for Associate Professors. PhD students teaching DXARTS foundations classes are supervised by faculty members leading each area of study.

Introductory Classes (level zero: DXARTS 200, 450, 460, 470)

Through our “zero-classes” students receive a foundational digital media education. We expect students taking these classes to acquire knowledge and expertise to get entry level jobs in multiple areas of the media industry. These classes also prepare students for our more advanced curriculum and are offered multiple times a year (usually in Summer, Fall, and Spring quarters). Beside these foundational studio classes DXARTS also offers DXARTS 200, a large lecture class providing a comprehensive survey of the history and current trends of Digital Art and New Media.

Advanced Classes (levels one and two: DXARTS 451/2, 461/2, 471/2)

DXARTS has developed new methodologies to work at the crossroads of art and technology which could benefit Arts, Engineering and Science teaching. These methodologies are based on the use of creative approaches to technology and novel ways of teaching with technology, with focus on the development of concepts and ideas rather than in problem solving. A cornerstone to this approach is the use of creative coding which is the foundation to all our advanced courses.

For instance, in our Digital Sound two-quarter sequence (DXARTS 461, 462) students learn fundamental principles of music, acoustics, psychoacoustics, and digital signal processing through experimental assignments using a real-time programming language (Supercollider⁹). Each assignment presents the students with a creative challenge which also includes conceptual underpinnings. For example, for the first part of an assignment they are asked to write a program that could synthesize a bell sound just using basic sinusoidal components (oscillators), and for the second part they are asked to write an algorithm that would generate a short piece of music using the program written for the first part. Before the assignment they are exposed to the theory of bell acoustics, the concept of additive synthesis, and the psychoacoustic mechanism of spectral fusion. They also listen to a paradigmatic computer music composition using this technique and are asked to analyze it (without using music theory, just using their ears and drawing graphs), focusing on how technical and aesthetic aspects interact. The result is that students from all different backgrounds end up creating a synthesizer and composing with it using algorithmic principles. The assessment for the assignment is both technical (how did you write your code?) and artistic (how does your piece compare to other

⁹ <http://supercollider.github.io/>

pieces in the literature?), this assessment takes the form of a listening and code critique session in which all the students get to listen and see everyone's work and give feedback to each other.

Similar examples could be found in any of our other advanced courses (Digital Video, DXARTS 451-452; Mechatronics, DXARTS 471-472). Our expectation is that students taking these course sequences will get a deep understanding of how generative digital artists do research and produce work and at the same time will acquire technical knowledge that would open them many paths either in the industry, graduate school, or academia.¹⁰

Special Topics and Research Seminars (DXARTS 490 and 500 level)

One of our main pedagogical goals is to transfer our research and discoveries to the UW community and to apply some of our experimental methods to teaching. Our Research Seminars are the avenue for this transfer and—as collaborative research is at the core of DXARTS—many of them are taught by multiple faculty many times from across disciplines and colleges. The list below presents several paradigmatic instantiations of our DXARTS 490 Special Topics class:

- Art and the Brain: This interdisciplinary studio course explores the intersections between Art and Neuroscience. Led by faculty from DXARTS and the Program in Neuroscience, it explores a wide range of topics including computational systems, electronic media, data visualization, conscious agents, artificial intelligence, perception and creativity. The course also includes lectures, paper review, student presentations and creative projects in a hands-on laboratory. Students select areas of focus and develop individual or collaborative research projects that intersect both fields¹¹.
- Art and Law: Privacy aspects of James Coupe and Juan Pampin's piece *Sanctum* brought up a large number of concerns from the Henry Art Gallery and the UW which put the project on hold for several months before its installation. To address these concerns the artists consulted with the Entrepreneurial Law Clinic, a service from the Law School. As a result of this collaboration a set of recommendations were produced by the clinic's lawyers with the goal of mitigating risks related to those privacy concerns. These recommendations were reviewed by the Attorney General Office of the UW and finally approved, allowing the Henry to move forward with the installation of the piece. This experience triggered the idea of creating a graduate seminar in collaboration with faculty at the Law School. This graduate seminar was attended by students from DXARTS and

¹⁰ Several undergraduate students who have taken our classes ended up working for Adobe, Microsoft, Unity Technologies, etc., others have decided to switch to Digital Arts for their graduate education and have been accepted to programs at Stanford, Columbia, UCSB, etc. Many of our former PhD students are currently using this methodology to teach at universities around the world.

¹¹ This course is very popular and has been taught every year since it was created in 2013, our plan is to give it its own number and possibly cross list it with the Program in Neuroscience.

the Law School who worked together to discuss and develop art projects that challenge the notions of law and privacy. The class was co-taught by Professors James Coupe (DXARTS), and Professors Sean O'Connor and Ryan Calo (Law School).

- Data-driven Art: This is a studio course in which students are introduced to making art using databases, audio/video corpuses, remote/cloud-based data and metadata. The class considers the implications and possibilities of artists using such systems, looking at dynamic, algorithmic based approaches to composing with highly distributed collections of data. The class includes weekly discussion, lectures and labs.
- E-textiles & Wearables for Art & Design: This studio course is an introduction to experimenting with electronic textiles, soft-circuits and wearable technology. It provides hands-on prototyping for physical computing projects that explore the body as an interface of control for interactive environments. The students engage with smart materials, handcrafted electronics, and creative programming with Arduino to design their own interactive wearables. E-textiles and wearable computing can be used in multimedia performance projects, interface or game design, medical monitoring systems, and also as educational tools for people of all ages.

Research Seminars

500-level seminars are our most advanced classes. The curriculum for these courses is a continuation of topics presented in our advance media sequences which are a requirement for enrollment. Below is a list of several of these advance seminars:

- DXARTS 528 Real-Time Digital Image Processing: Theory, aesthetics, and practice of real-time video manipulation/performance systems. Theory and high-level programming of image synthesis and processing.
- DXARTS 465 Spectral Modeling: Theory and practice of sound modeling in the spectral domain. Custom-designed software for spectral modeling and re-synthesis. Implementation of software tools for spectral analysis, transformation, and synthesis. Emphasizes the development of new software tools and the production of experimental sound compositions.
- DXARTS 567 Sound and Space: Theory and practice of spatial sound. Spatial hearing mechanisms. Stereo microphone techniques. 3D sound field capture and reconstruction using first and high order Ambisonics, VBAP, WFS, and other advanced sound spatialization techniques. Introduction to aural architecture and spatial audio composition with emphasis on the production of experimental sound pieces and installations.

- DXARTS 571 Telematic Art: Focuses on the production of artworks that make use of real-time information networks. Topics include Internet art, database-driven art, and telematic installation art.

DXARTS Degrees

DXARTS Minor

The DXARTS Minor offers a curriculum covering a wide variety of media including Digital Sound, Digital Video, and Mechatronics, as well as many Special Topic courses. Students in the DXARTS Minor have maximum flexibility to take classes, allowing them to either focus in one media area (Video, for instance) or to take classes across all media areas. The single required foundational course, DXARTS 200, provides a comprehensive survey of the history and current trends of Digital Art and New Media, ensuring that students minoring in DXARTS will have a historical perspective and conceptual framework for their intellectual work and artistic practice.

Program Requirements and Paths

DXARTS Minor requirements are:

- DXARTS 200 (5 credits).
- 25 additional credits from DXARTS courses.

These 25 additional credits could come from any of our Introductory Classes (level zero)¹², Advanced Classes (levels one and two), or Special Topics courses (all these are 5-credit courses).

For instance, a student willing to get a well rounded introduction to Digital Arts could take the followings courses:

- DXARTS 200 (required)
- DXARTS 450 (Video)
- DXARTS 460 (Sound)
- DXARTS 470 (Mechatronics)
- 2 x DXARTS 490 (Special Topics)¹³

On the other hand, a student willing to focus in Sound could take the following courses:

¹² Please note that all our zero-level courses are offered multiple times a year, usually in the Summer, Autumn and Spring quarters.

¹³ Please note that students can take as many Special Topics (DXARTS 490) classes as they like. The topics for these classes vary from quarter to quarter and they are not sequential (students still need to contact the instructor for an add code).

- DXARTS 200 (required)
- DXARTS 460
- DXARTS 461
- DXARTS 462
- 2 x DXARTS 490¹⁴

Learning goals and outcomes

We expect students obtaining a DXARTS Minor to receive a foundational Digital Arts education. Our curriculum has been designed with this objective in mind, in particular our zero-level classes in which students acquire knowledge and expertise which will prepare them for entry level jobs in multiple areas of the media industry. DXARTS Minors have also the opportunity to go in depth into a particular media area by taking our Advanced Classes (levels one and two). Our expectation is that students taking these course sequences will get a deep understanding of how generative digital artists do research and produce work, and at the same time will acquire technical knowledge that would open them many paths either in the industry, graduate school, and the arts in general.¹⁵

DXARTS PhD

The goal of doctoral education in DXARTS is to create equal opportunities for artists to discover and document new knowledge and expertise at the most advanced levels higher education can offer. Unlike the Master of Fine Arts degree, which is the usual two-year professional degree of art practice, the PhD is a generative research oriented degree requiring a substantial commitment to graduate-level study and reflection. The PhD degree signifies that an individual is qualified to investigate fundamental problems in the nature and practice of Digital Arts and Experimental Media, pursue original creative and technical research in the field, and contribute to the development of knowledge and its consequences in society and culture. Students who successfully complete our doctoral program are expected to possess substantive knowledge and expertise in an area of the field, and in advanced methods of inquiry that are suited to the field along with the demonstrated ability to conduct independent original inquiry.

Learning goals and outcomes

The intent of the PhD program is to identify, recruit and support the most outstanding individuals pioneering the most advanced digital and experimental arts research being undertaken in the

¹⁴ Please note that students can take as many Special Topics (DXARTS 490) classes as they like. The topics for these classes vary from quarter to quarter and they are not sequential (students still need to contact the instructor for an add code).

¹⁵ Several students who have taken our classes ended up working for Adobe, Microsoft, Unity Technologies, etc. and other media companies. Others decided to switch to Digital Art for their graduate education and have been accepted to Masters programs at Stanford, Columbia, UCSB, etc.)

world. While entering doctoral students are required to have developed a significant body of work, as well as established substantive careers, the inherently interdisciplinary curriculum in DXARTS implicitly requires all students to diversify their artistic practice across a minimum of two major content areas in DXARTS (Video, Sound, Mechatronics, etc.) or pioneer completely new ones. DXARTS graduate students usually take one or two of our advanced level sequences, as well as Special Topics courses and Research Seminars related to their area of practice. Also, in their first three years in the program, PhD students are required to take DXARTS 500 (Research Studio) every quarter. This seminar covers recent advances and current trends in Digital Arts and Experimental Media research. The class is also a forum for students to discuss and demonstrate their own ongoing research and creative projects.¹⁶

Doctoral students also play a major role in the research and educational missions of DXARTS. Once admitted, a DXARTS doctoral student receives an initial three-year funding package that includes: stipend (ASE salary), tuition fees, and 24/7 studio and laboratory access. All funded students have appointments as Teaching Assistants, Staff Assistants, or Research Assistants. During their time as funded PhD students many have multiple assignments either assisting in the instruction of courses taught by faculty members, as lead instructors teaching some of our introductory courses, as lab assistants helping to run and maintain our laboratories and studios, as research assistants, working with faculty on major collaborative projects, and as research fellows pursuing their own projects and working on projects in collaboration with others. The continuation of funding each year is contingent on availability of funds, as well as progress of the doctoral student toward the goals set forward by the program and in accordance with their advisor. A modest number of doctoral students continue to receive funding for all five years depending on their impact in the program, institution and their field. Graduate advisors in DXARTS are selected annually and are rotated every autumn quarter.

Teaching and Mentoring Outside the Classroom

All students in DXARTS are assigned a faculty advisor at the actual point of “first contact” or application to the program. Close relationships through the application process for doctoral students often reinforce the sense of community and investment in DXARTS, and has helped the program maintain its 100% acceptance rate of graduate admission offers to first round drafts. Faculty mentors rotate annually providing students a better education, more mindshare among the faculty, and distributing the responsibility of mentoring the students across the most rational alignment of faculty research vectors as their work develops throughout the course of their doctoral studies. Advisors meet with students at least once each quarter providing feedback on choice of classes, research vectors and artistic guidance.

¹⁶ For a detailed description of the DXARTS PhD timeline, including exams and final project specifications, please visit: <https://dxarts.washington.edu/dxarts-phd-degree-timeline>

Independent Study

All DXARTS PhD students are required to take DXARTS 600: Independent Study or Research. Students can sign up for independent study credits with their faculty mentor or with other faculty in DXARTS. Students meet with the faculty at the beginning of the quarter to establish a plan of study and a schedule of meetings and are required to turn in a final report or project by the end of the quarter (it is common for projects to continue across quarters).

Advanced undergraduate students have also the option of taking independent study credits through DXARTS 499: Undergraduate Research. Every year many of these students present their research projects at the Undergraduate Research Symposium.¹⁷

Research Projects

Another opportunity for mentoring outside the classroom is through the participation in faculty research projects. During their time at DXARTS PhD students are assigned to work with faculty either as Research Assistants (RA) or Graduate Student Assistants (GSA). During these assignments students perform research supervised by the lead faculty member and are required to participate in all team meetings related to the project. In many cases students appear as co-authors of art pieces and papers issued from these research projects.

Individualized Studies Programs

DXARTS faculty also supervise students in the Interdisciplinary Individual PhD Program (iPhD) and the Individualized Studies undergraduate program. For instance, Prof. Juan Pampin is currently supervising iPhD student Judy Twedt, who is working on the sonification of climate data. Her other iPhD supervisors are Cecilia Bitz, Professor in Atmospheric Sciences and Director of the Program on Climate Change, and Dargan Frierson, Associate Professor in Atmospheric Sciences.¹⁸

Prof. Pampin is also supervising James Wenlock, an Individualized Studies major working on Computational Auricular Acoustics. James has also been taking part of our Ambisonics research team under the supervision of Joseph Anderson and has more recently joined our Art+Brain Lab, to assist Prof. Thomas Deuel with his Encephalophone project.

¹⁷ DXARTS Professor Juan Pampin was one of the moderators for the 20th Annual Undergraduate Research Symposium. His curated session included a presentation by DXARTS Minor Patience Idegwu, who had taken independent study with Prof. Pampin to develop a video art project for the Samuel E Kelly Ethnic Cultural Center.

¹⁸ Judy's work has been profiled last year by UW News:

<http://www.washington.edu/news/2017/01/18/listen-to-the-earth-smash-another-global-temperature-record/>

Section III: Scholarly Impact

DXARTS Research

Art as research is not a new phenomenon. The processes of imagination, exploration, discovery, and reflection are universal among artists, scholars, scientists, and engineers. All seek paths of unique discoveries that will improve our lives and communicate our understanding of the world around us. The digital era brings with it remarkable new promise in these endeavors. However, at the same time, it places fundamental and substantial new requirements on artists who seek to engage in more than being simply “users and consumers” of existing technology, but instead wish to pioneer the most advanced artistic discoveries and inventions in the field. To support the highest level of this promise DXARTS covers a vast range of arts practice, collaborative exploration, technical invention and creative research across multiple disciplines.

While areas such as Video, Sound, and Mechatronics, need initially to be viewed, and to some degree taught, as separate areas of research and practice, there is so much overlap and collaborative synergy between them at higher levels of faculty and doctoral practice that clear lines of division at the advanced level are not as meaningful and in practice can impede innovation, much the way medicine, science and engineering have witnessed. Each area of Digital and Experimental Arts encompasses a specific mixture of the same set of disciplines as each of the others, but the mix is uniquely balanced in each research genre. Viewed comprehensively, one finds a fine-mesh network of vibrant interdisciplinary interactions between them all. The DXARTS program takes advantage of this convergence to create a distinct multidisciplinary community of artists, researchers and scholars whose work is best identified collectively as belonging to Digital Arts and Experimental Media. All of the areas depend on the collaboration of artists, engineers, and scientists for their current existence and continued growth in terms of discovery and application. All challenge assumptions about the traditional arts areas from which they emerged as well as the engineering and science disciplines with which they interact. Together they form a powerful nucleus of knowledge, expert skill, and innovation that has distinctive strength because of its interdisciplinarity.

Research Support

Research is one of the priorities of DXARTS, and is supported in three main ways:

1) Facilities: our world-class research facilities are available 24/7 to all our faculty and PhD students. Along with our main research labs in Raitt Hall and Ballard each faculty member has an assigned lab/studio space for their own research. Graduate students are also assigned either on- or off-campus studio space.

2) Staff: our facilities are maintained and supported by a crew of world-class tech staff (Research Scientists) and graduate students (GSAs). Faculty also receive research assistance from graduate students (RAs) and Research Associates. Our faculty and graduate students receive an equal share of support from the tech staff.

3) Funding: research funds are central to the continuing forward momentum of research and artistic production that has placed DXARTS as one of the world leaders in Digital and Experimental Arts. An important use of the annual DXARTS budget is the allocation of dedicated research funds of \$5,000 a year to each of our four primary faculty members. Graduate students also receive \$800 a year in research funds. These funding levels are small by standards in many science and engineering areas but they allow faculty, post-docs, and students to purchase small equipment and to travel to conferences, festivals, and important art venues. DXARTS staff also receive support to attend conferences and festivals and to take courses and workshops that keep them up to date with their areas of expertise.

Faculty Research

The following is a list of selected research projects by our core faculty. These projects show the level of synergy existing among our faculty and the collaborative spirit of our center. All these projects represent significant contributions to the field of Digital Art and Experimental Media.

Performing with the Brain (2017-present)

This ongoing research project is a collaboration between Professors Juan Pampin and Richard Karpen and Acting Assistant Professor Thomas Deuel. The goal of the project is to develop a new form of musical performance and interaction based on biofeedback for patients suffering from motor disability from brainstem stroke, spinal cord injury, or Amyotrophic Lateral Sclerosis (ALS). Patients will be trained to perform the Encephalophone, a novel Brain Computer Music Interface (BCMI) developed by Dr. Thomas Deuel that allows the user to create improvised music in real time using cognitive control of Electroencephalogram (EEG), without movement. Thus patients whose brain no longer effectively controls the movement of their limbs can use those parts of their brain to generate music for enjoyment, and to help improve their neurological rehabilitation. Using the Encephalophone patients will be able to control a variety of specially-developed music devices, including electroacoustic and mechatronic instruments. This project is hosted at DXARTS interdisciplinary Art + Brain lab and done in collaboration with Swedish Neuroscience Institute, where the clinical trials are currently taking place. DXARTS received a \$80K Creativity Connects grant from the National Endowment for the Arts to support this project.¹⁹

Human Subjects (2017-present)

¹⁹ This project has attracted a lot of attention from the media, please see Appendix F for a list of selected media articles published in the last five years.

This ongoing research project is a collaboration between Professors Juan Pampin, Richard Karpen, and the JACK String Quartet. *Human Subjects* is a music composition being developed through a series of residences by the JACK supported by a grant from the Andrew W. Mellon Foundation to explore the nature of creative research at a top public research university. Research Associate Marcin Paćzkowski is in charge of most of the technical development for this project.²⁰

Sanctum (2013- 2015)

Sanctum is a public art installation done in collaboration by professors James Coupe and Juan Pampin. The piece was exhibited on the façade of the Henry Art Gallery from May 2013 until November 2015. Sanctum used the persistent flow of people around the Henry Art Gallery as input, extracting narratives from the demographics of passers-by and the patterns of their movement. The flow of people was used as a physical analogue to another type of crowd, the virtual inhabitants of social networks such as Facebook.

Sanctum was commissioned by the Henry Art Gallery. The project was selected from 91 applications who answered an open international call, soliciting proposals for a site-specific project to transform the façade of the museum's main entrance and to engage the UW population and the many visitors who pass by the Henry every day. Almost every single member of the DXARTS community was involved in the production of Sanctum: a team of Research Scientists, Research Associates, graduate and undergraduate students was put together to achieve this ambitious project.

During the two and a half years Sanctum was exhibited, DXARTS collaborated with the Henry Art Gallery in the organization of several activities, the most important of them being "Surveillance & Privacy: Art, Law, and Social Practice", a multi-day symposium that took place from November 20-25, 2014. In addition to project-focused sessions and panel discussions that took place at the Henry Auditorium, the symposium featured lectures by Marc Rotenberg and Cory Doctorow at Kane Hall.

Swarm (2013-2015)

Swarm is an interactive video installation by professor James Coupe. The piece takes the logic of social media – demographically organized communities based around common interests, habits and markets – and transposes it onto gallery audiences. Using four rows of monitors, the work generates competing panoramic representations of the gallery space that appear to be exclusively occupied by specific groupings of people – men in their 20s, women in their 50s, people of Asian descent, people dressed in black, men with beards. Each group is shown as what appears to be a live video image, with people inserted into a 'crowd' alongside others who have previously visited the gallery. Some crowds are much larger than others – a large group of

²⁰ For more information about this project please visit:
<https://meanycenter.org/engage/creative-fellowships-initiative>

middle-aged white women on one panorama, standing around, waiting for something to happen, may juxtapose with a solitary Latino male on another. Different demographic groupings territorialize the gallery's spaces, their numbers dynamically expanding and contracting.

Swarm was commissioned by the Toronto International Film Festival and was originally exhibited at the Museum of Contemporary Canadian Art, Toronto, Canada, from September 4 to December 29, 2013, as part of the show "David Cronenberg: Transformations". In 2014, Swarm received an Honorary Mention in the Interactive Art category of Prix Ars Electronica, and was exhibited at their CyberArts show at the OK Museum of Contemporary Art, in Linz, Austria, from September 4 – 14, 2014. More recently, Swarm was part of the international Global Control and Censorship at ZKM, Karlsruhe, Germany, from October 3, 2015 – April 1, 2016.

Most of the technical work for Swarm was done by former DXARTS Research Associates Yi Ding and Zhebin Zhang, and former DXARTS PhD student Tivon Rice was in charge of the fabrication of the monitors structure. The piece was created with support from a Creative Capital grant.

Cosmic Bitcasting (2016)

Cosmic Bitcasting is a collaboration between professor Afroditi Psarra and experimental physicist Cécile Lapoire. Whether human beings are exploring subatomic worlds or outer space, wherever our journeys of discovery take us, we're able to get a picture of the invisible only by means of measured data. Cosmic Bitcasting implements this idea in the form of an interface worn right on the body, and thereby reinterprets the connection between human and cosmos. Cosmic Bitcasting employs sensors to transform the cosmic radiation that neither the Earth's atmosphere nor the outer layer of our own body shields us from. With light signals and vibrations, the interface reports the detected presence of every elementary particle that, as radiation from outer space, has found its way through the atmosphere to us.

Cosmic Bitcasting was presented in 2017 at the Alchemists of Art and Science exhibition at the Ars Electronica Center in Linz, Austria.

PhD Students Research

The following is a list of selected research projects by our PhD students. The broad scope of these projects represent a small sample of the research graduate students do in DXARTS. Most of these projects required the development of new technologies, innovative research methodologies, and were realized through collaboration with other units on campus. Many of these artists graduated from our PhD program in the last few years, some of them are currently appointed as faculty at academic institutions from around the world, others work as freelance artists presenting their work at important international festivals and venues.

Axial (2014)

Axial is a sound installation by DXARTS alumnus Hugo Solís, the piece is his PhD dissertation project. In *Axial* a cargo container is employed as a resonant object: resonant in its acoustic sense because the container is used as sound generator, but also resonant in its metaphorical connotation because the container and the generated sounds translate and represent the geological properties of Axial, an active submarine volcano on the Juan de Fuca Ridge located about 250 miles off the coast of Oregon. The container is also the space-instrument for interpreting the scientific data obtained during the oceanographic expedition Enlighten'10, during which the artist recorded the sounds of the hydrothermal vents located in the area at depth of over 4,500 feet. In order to achieve this project Hugo received significant support from the Oceanography Department and professor John Delaney (who was chair of Oceanography at the time) was a member of his graduate committee. Other support for this project came from an Amazon Education grant, the City of Seattle Office of Arts & Cultural Affairs, 4Culture and Mexico's Fondo Nacional para la Cultura y las Artes. Hugo Solís is currently Professor of Digital Art at Universidad Autónoma Metropolitana of México.²¹

Horizon is an Imaginary Line (2013)

Horizon is an Imaginary Line is a light and sound installation by DXARTS alumna Maja Petric, the piece is her PhD dissertation project. *Horizon is an Imaginary Line* is an experimental light and electroacoustic installation that innovates the use of projected moving image with haze to transform the perception of space into a poetic experience of nature. The work is installed in a completely darkened space and consists of 4 rotating projectors that are programmed to project animated light throughout a space filled with haze. The projection is focused on homogeneous clouds suspended in the air. Light beams in the interaction with steam particles become visible and seems they can be felt by touch. Light rays traveling from the projector lamp through space become seemingly tangible and create dynamic light sculptures that changes depending on the condition of fog and projected animation. Video animations are created to form an experience of light in abstract geometric forms that gradually evolves into the detailed organic shapes that embody the sublimity of nature. Kinetic light sculptures are accompanied by an electroacoustic ambisonic composition that is also made to transform the poetic experience of space and creates ever-changing experience. The sound space for the piece was composed by DXARTS PhD student Daniel Peterson.

For this project Maja received significant support from the School of Drama, in particular from professor Geoff Korf who was a member of her dissertation committee. The piece was presented at the Jones Playhouse Theatre on July 8, 2013. Maja Petric is currently a freelance artist living in the Seattle area, she was recently artist in residence at Microsoft Research.²²

²¹ For more information about Axial, please visit:
<http://hugosolis.net/hugosolisWP/phd-thesis/>

²² For more information about Horizon is an Imaginary Line please visit:
<https://www.majapetric.com/horizon-is-an-imaginary-line/>

Two Women (2015)

Two Women is a multi-channel video and sound installation with kinetic mechatronic sculpture by DXARTS alumna Ha Na Lee, the piece is her PhD dissertation project. Two Women is inspired by the invisible crisis of the suicide of the artist's grandmother. Though the motivation of her suicide is unknown, the work explores several possible ways to understand her death. The imagery of Two Women invokes themes of repression, resistance, submission, resignation, power, melancholy, death, and violence. The piece consists of an elderly Korean woman narrating a story where describes her room, a dream about a room with two machines, and a fantasy in which she sees her younger self drowning. The installation space is a cinematic realization of this fantasy, decorated as a domestic room in a state of decline and disrepair. A pair of kinetic machines dominate the space. The machines record suicide-related news stories as morse code physically punched on a roll of black paper. Each roll of punched paper slowly feeds into a pool of water where it forms a perforated projection screen for a video of a woman submerged under the water. The paper is pulled up to the ceiling where soft light reveals the structure and pattern of the punches.

Two Women was done in collaboration with former DXARTS Research Scientist James Hughes. The piece was exhibited at the 2015 Currents: The Santa Fe International New Media Art Festival, and was produced with support from Artist Trust. Ha Na Lee is currently a freelance artist living in Austin, Texas.

Convex Mirror (2014)

Convex Mirror is a mechatronic installation by DXARTS PhD student Robert Twomey. Resuming Parmigianino's project of self-portraiture in the age of intelligent machines, this project uses a CNC plotter, 180° circular fisheye lens, and custom software to record a layered image of place. Substituting computer vision and precision automation for the human eye and hand, this project operates at a physical precision and temporal duration beyond what is humanly possible. Laboring over a three-month period it produced a series of 12 site-specific drawings looking out of a storefront window in the Amazon building in downtown Seattle.

Convex Mirror was one of the works selected for the Art + Science, Dean's Club event in 2014, the piece was produced with support from Storefronts Seattle. Robert Twomey is currently ABD, he is Assistant Professor of Digital Media, in the Department of Art at Youngstown State University.²³

La Biblioteca Ciega (2011)

²³ For more information about Convex Mirror please visit:
<http://roberttwomey.com/convex-mirror/>

La Biblioteca Ciega is a sound and music performance by DXARTS alumnus Nicolás Varchausky, the piece is his PhD dissertation project. *La Biblioteca Ciega* is a site-specific piece commissioned by Secretaría de Cultura de La Nación Argentina for the old reading room of the former Argentine National Library, once ran by Argentine writer Jorge Luis Borges. The work is composed in two chapters: 1. Resonances, Turbulences and Explosions (an acoustic exploration of the alphabet); and 2. Photo-Sensitive Volumes I-III. In the first chapter, three electronic pieces are presented in complete darkness using a surround sound system, each of the pieces was realized out of the recording of a different consonant. These recordings were analyzed and re-synthesized revealing through algorithmic processing their inner soundscape. In the second chapter, members of the Banda Sinfónica de Ciegos (an orchestra of blind musicians) perform a set of photo-sensitive instruments that turn light into sound.

La Biblioteca Ciega received an Honorary Mention in the Digital Music and Sound Art category of Prix Ars Electronica 2013 and was sponsored by Yamaha Music Latin America. Nicolás Varchausky is currently professor of Electroacoustic Composition at Universidad Nacional de Quilmes, Argentina.²⁴

²⁴ For more information about *La Biblioteca Ciega* please visit:
<http://www.varchausky.com.ar/la-biblioteca-ciega/>

Part B: Unit Defined Questions

The following questions were defined in collaboration with the DXARTS core faculty. Answers to the first four questions were discussed collectively by the faculty. For the last question (Where would we want to be in 10 years from now?), individual responses from each faculty member were compiled.

1) What makes DXARTS unique?

DXARTS is unique in multiple ways, the three answers below are probably the most relevant for the context of this review.

a) Our particular place in the College and at the UW

- DXARTS is the only interdisciplinary research center in the Arts, its mandate is to support the emergence of a new generation of hybrid artists and to be a catalyst for creativity and innovation at the UW. DXARTS is also a STEM outpost in the Arts for those who want advanced technologies to be central to their arts practice. In addition, many students from the sciences and engineering take our classes every quarter.
- DXARTS is also unique in the way it was created and funded. Our center was created via the University Initiative Funds (UIF).²⁵ The UIF's goal was to "reallocate UW resources in order to support multidisciplinary initiatives that are ahead of their time and promise to be path-breaking and ultimately to leverage resources". This grant provided permanent funding for the center and startup money to build its labs and to hire faculty and staff. DXARTS is also unique among other UIF granted projects in that it was the only UIF granted to the Arts and in that it proposed to create a new and innovative PhD program as part of the center.

b) Who we are

- DXARTS has attracted faculty to the UW from all around the world and this itself can be seen as a unique contribution to the university at large. DXARTS faculty bring with them a network of international research connections, which has put our program and the UW in the international Digital Arts map. They have also secured grants and are recipients of international prizes which give our program and the university a lot of visibility and prestige (see Appendix F for a collection of press reviews). This group of faculty is also unique in that it is made of a group of world-renowned artists and polymaths working at the crossroads of Art, Science and Technology. Without the tether of a particular and singular discipline, the DXARTS faculty have

²⁵ <http://www.washington.edu/uif/uifsummary.html>

as their mission to collaborate with a diversity of colleagues from the arts as well as with colleagues from areas such as Engineering, Law, Neuroscience, etc. (see Appendix H for a map showing our network of on-campus collaborations).

c) Our PhD program

• The DXARTS PhD program is also unique in the Arts as most art practice programs only offer a Master's (MFA) as the terminal degree. Our program has a strong international reputation and attracts students from all around the world. There are many aspects of our program that make it unique and attractive to digital artists that come to the UW after finishing their Master's degrees, here are just a few:

- It was the first practice PhD program for generative digital artists in the world, and is currently one of the few in the nation.
- DXARTS already has a 15-year trajectory and several generations of PhD alumni that prove the success of its program.
- It offers students funding at a similar scale as provided in the sciences, allowing them to develop long-term collaborations with faculty and students in DXARTS and other units.
- Students receive support for their research, both in terms of facilities and funding to show their work at international conferences and festivals.
- Students are closely supervised by the faculty through a mentoring system which includes regular advising meetings and numerous opportunities to participate in faculty research.
- Students get many opportunities for teaching, both as TAs and as instructors of record, which prepare them for getting academic positions (many of our graduate students are hired by national and international universities even before getting their PhD).

2) What are our strengths?

a) Our research

DXARTS faculty and students have the privilege to do experimental research in the Arts with the support of a public university. For this reason, research is taken very seriously at DXARTS and important results are expected. As an example of this commitment, below is a list of important research initiatives recently started by the DXARTS faculty:

- In Winter 2013, DXARTS was chosen as the inaugural recipient of the Bergstrom Award from the College of Arts & Sciences to create the Art + Brain Lab. The Bergstrom Award for Art and Science was established for the purpose of supporting projects or activities at the UW that enhance the student experience and bridge the intersection between Art and Science. The Art + Brain Lab enables students and faculty, from both arts and sciences, to conduct hands-on research, fostering artistic collaborations arising from investigations at the intersection of Neuroscience and Digital Art.²⁶
- In 2015 DXARTS Associate Professor James Coupe was the recipient of a Bergstrom Award for a Big Data Art Projects Initiative. The initial \$15K grant was matched by a \$15K grant from the eSciences Institute that will allow to present projects issued from this initiative at a professional venue.
- Leveraging on the success of the Art + Brain Lab, Professors Juan Pampin and Richard Karpen received a \$80K grant from the National Endowment for the Arts to do research in collaboration with Swedish Neuroscience Institute. This project is done in collaboration with DXARTS Acting Assistant Professor Thomas Deuel who is currently conducting clinical trials of his Encephalophone instrument at Swedish Hospital.
- In 2016 Assistant Professor Afroditi Psarra started the DXARTS SoftLab. This new lab, funded through Prof. Psarra's startup funds, is a space dedicated to research and development of artistic projects using soft circuits and wearable technology. The SoftLab is located at DXARTS Ballard warehouse and is equipped with materials, tools and machines specific to the field of electronic textiles, such as a wide-collection of conductive and resistive yarns, shielding and piezo-resistive fabrics, miscellaneous electronic components, sewing, overlock and computerized knitting machines, and is soon to be equipped with two digital embroidery machines that will be acquired through an STF grant. The location of the SoftLab, within the Ballard FabLab, facilitates the engagement of students taking DXARTS studio classes with electronic textiles and encourages them to develop cutting-edge research on e-textile fabrication techniques, by inventing their own wearable technologies.

Finally, artworks issued from research done at DXARTS get exhibited and performed around the world. For example, the Warsaw Autumn festival—one of the top new music festivals of Europe—has dedicated a full evening show to DXARTS in which pieces by the faculty and PhD students were showcased. Recently two members of our faculty, Profs. Afroditi Psarra and James Coupe, had their work exhibited at Ars Electronica, the most important Media Arts festival in the world.²⁷

²⁶ It should be noted that College donor Don Bergstrom decided to provide the funds for this award after a tour of DXARTS that also included a site visit of *Sanctum*, a site-specific installation by Professors James Coupe and Juan Pampin at the Henry Art Gallery.

²⁷ Prof. Coupe's piece *Swarm* received a honorable mention in the Prix Ars Electronica 2014.

b) Our curriculum

Our curriculum is unique in the Arts and it crosses over into many of the STEM areas. Our courses are open to all students at the UW and after the termination of our BFA program—which demanded 50% of the seats in our classes—most of the enrollment for our courses comes from outside DXARTS, including attracting students (and Student Credit Hours²⁸) from outside the College of Arts and Sciences. The termination of our BFA also allowed for more flexibility in our curriculum, opening the door for new experimental courses like DXARTS 490: Special Topics, which changes subject every quarter. The inception of our new Minor in DXARTS has also helped attract more students from the Arts into our classes, as this flexible program offers them the opportunity to get a complimentary degree with emphasis in Media Arts covering a curriculum which isn't offered in any of the other art units.²⁹

c) Our PhD program

Our PhD program is one of the few of its kind in the country and attracts students from all around the world. We offer admission to only a few applicants each year who are top emerging artists. We have an acceptance rate by those offered admission of 100%. These elite students usually come from master's programs at highly prestigious institutions such as The School of the Art Institute of Chicago, Columbia University, New York University, Carnegie Mellon University, MIT, University of California San Diego, etc. DXARTS PhD students bring to the UW their artistic and technical expertise which they transfer to the students in our classes by working as TAs or instructors of our courses. Many students from our PhD program are offered academic positions in national and international universities even before graduation. Several of them have started labs similar to DXARTS at their hiring institutions and continue to be important members of the digital arts international community.

d) Our faculty

Unlike the majority of other Digital Art PhD programs, DXARTS faculty are practicing artists, working to explore and expand the Digital Arts paradigm and inspire students by example. All of the core faculty hold doctoral degrees themselves. Despite the relatively small number of faculty at DXARTS, an unbelievably broad spectrum of backgrounds, practices and expertise are covered. These backgrounds ensure the regular presence of DXARTS-sponsored projects at major galleries, museums, festivals, concerts and conferences throughout the world, resulting in regular grants, awards, publications, catalogs and reviews. DXARTS provides a vital support environment that gives faculty a platform from which to engage in these innovative practices

²⁸ The number of Student Credit Hours (SCH) DXARTS produces has been growing in the last five years and we project it will continue growing in the years to come. Appendix E shows a graph of SCH for our courses in the last five years as well as student demographic information for our courses.

²⁹ Please refer to Appendix D for a graph showing the number of students who have taken DXARTS class in the last five years organized by department. It should be noted that the School of Art, Art History and Design contributes the most students to our courses.

through the availability of unrivaled resources, rare interdisciplinary dialog and significant support and funding. Collaboration is considered essential for the realization of the many highly ambitious projects taken on by DXARTS faculty. It is therefore common for collaborations to occur between DXARTS faculty, as well as with colleagues from other departments and experts from other institutions. Faculty positions at DXARTS are consequently highly sought-after, a fact that is evidenced by the large number of applications received for our recent Assistant Professor opening.³⁰ DXARTS faculty regularly win grants, commissions and awards that provide opportunities for their own research as well as support for the program as a whole, and to enable the involvement of doctoral students in major projects. The international reputation of our faculty is also the reason high-profile students apply to our PhD program. Our faculty is also in charge of our research programs, which have attracted the attention of the regional and national media for their contribution to the arts, culture and society.³¹

The interdisciplinary research of our faculty and their collaborations across campus places DXARTS in a very particular place, acting both as a hub for the Arts as well as an outpost of the STEM areas within the Arts. DXARTS faculty are charged with generating new areas of inquiry, creating bridges from the Arts to the Sciences, Engineering, etc. Our interdisciplinary mandate also puts us in the perfect place to foster innovation at the UW. This particular role goes beyond the campus walls as the DXARTS faculty have collaborators all around the world. These collaborators include other artists, researchers, artistic institutions as well as research labs and companies.³²

e) Our facilities and equipment

DXARTS is widely considered as having some of the finest laboratories, classrooms and facilities of any Digital and Experimental Arts program in the world. The DXARTS home is located at Raitt Hall, on the Main Quad at the center of the University of Washington's campus. DXARTS also maintains extensive off-campus research facilities located in a warehouse in the Ballard neighborhood of Seattle. DXARTS places extremely high technological demands on labs and facilities involved in the kind of vanguard, forward-looking pursuits in Digital Arts and research that are the primary areas of the program. By creating unparalleled facilities we have been able to enable that participating faculty and students can create innovative and meaningful advances in the state of the Digital and Experimental Arts. Thanks to these advanced tools, not only are DXARTS faculty able to do pioneering research, but DXARTS students are exposed to and have the opportunity to work with cutting edge systems that are substantially ahead of the curve.

³⁰ We received more than 100 applications from all around the world for this position. Dr. Afroditi Psarra was the top candidate for this search.

³¹ Please refer to Appendix F for a list of significant media coverage of DXARTS.

³² Please refer to Appendix H for a map showing UW collaborators, and to Appendix I for a list of outside collaborators.

We should also note that DXARTS is a research hub for the Arts. Our facilities are unique in the Arts, they don't duplicate resources in other art units and are open for all the students on campus. Our labs are supervised by the faculty and dedicated technical staff, students get codes to access them 24/7 and can make reservations for special studios and labs via our online calendars.³³

Aside from the fixed studio and lab equipment, DXARTS also offers a wide range of professional equipment. Our center maintains a large-scale, high-volume, custom in-house checkout and reservation system for a wide range of standard portable and one of a kind Digital Arts research equipment. Our equipment is available to all students on campus who can reserve it online and check it out at our on-campus facilities at Raitt Hall. A large part of this professional equipment has been funded by Student Technology Fee (STF) grants; in the last five years DXARTS has been the recipient of more than \$250K in equipment from STF.³⁴ There are multiple reasons why DXARTS has been extremely successful at receiving STF funds, the first one is the nature of our requests, which are usually for special pieces of equipment not available in other units on campus. The second is the accessibility we offer to this equipment which is not common among other units on campus. The third is the investment DXARTS makes into maintaining the equipment, which is twofold: DXARTS takes care of the insurance costs for highly expensive equipment, and it also provides a dedicated staff member (Ewa Trebacz) to take care of the equipment maintenance and its checkout (including programming and maintaining our online database system).

f) Our collaborative spirit

DXARTS constantly collaborates with other units on campus. In the last seven years, we have developed a strategic relationship with the School of Music co-sponsoring the Music of Today concert series, featuring new works by faculty and students as well as bringing international guest artists to campus to present their work. The highlights of this series are the DXARTS Fall and Spring concerts, in which music and sound art works are played through a custom designed 3D audio system. These concerts offer the audience an artistic experience unique in the region. DXARTS collaborates with the Meany Center for the Performing Arts for the production of these concerts.³⁵

DXARTS has collaborated with the Henry Art Gallery for the production of *Sanctum*, a public art installation done in collaboration by Professors James Coupe and Juan Pampin that was exhibited on the façade of the museum two and a half years. The Henry and DXARTS staff worked together to install the piece and we provided maintenance and tech support over the long period the piece was exhibited. As part of the *Sanctum* exhibit DXARTS collaborated with

³³ For a detailed description of the DXARTS facilities please visit:

<https://dxarts.washington.edu/facilities>

³⁴ <https://uwstf.org/>

³⁵ Please visit Appendix G for a list of selected DXARTS sponsored and co-sponsored events between 2011 and 2017.

the Henry in the organization of several activities, the most important of them being “Surveillance & Privacy: Art, Law, and Social Practice”, a multi-day symposium that took place from November 20-25, 2014.

In 2015 DXARTS collaborated with the Henry Art Gallery for Ann Hamilton’s show *the common SENSE*. DXARTS PhD student Robert Twomey designed and constructed the hardware and software used to control the 21 electromechanical bullroarers installed in the museum’s South gallery. During this exhibition, Prof. Juan Pampin presented his piece *...that language is shaped air...* a commission from the Seattle Chamber Players especially composed for the electromechanical bullroarers and an instrumental ensemble of eight musicians.

DXARTS is currently collaborating with the School of Music and the Meany Center for the Performing Arts as part of the Creative Fellows Initiative, a three and a half year grant from the Andrew W. Mellon Foundation to explore the nature of creative research at a top public research university. For more information about this project please visit: <https://meanycenter.org/engage/creative-fellowships-initiative>

g) Being nimble and adaptive

One of our ongoing challenges is how to maintain DXARTS leading role in Arts while changing. Finding nimble ways of adapting our curriculum and research is part of DXARTS mandate. In the last ten years we have achieved this by making important changes to our program, below are the most significant ones:

- Offloading areas of research to other units after incubating them for several years, allowing us to focus on new emerging disciplines. A good example of this is support for Digital Humanities which took place at DXARTS former service center CARTAH³⁶, closed in 2011. Digital Humanities research has become one of the central areas of support offered by the Simpson Center for the Humanities (<https://simpsoncenter.org/programs/digital-humanities>).
- Terminating our BFA program and replacing it with a Minor in DXARTS, allowing us for more curricular flexibility and to teach a larger number of undergraduate students from all around campus.³⁷
- Exploring new areas of inquiry such as Art and Neuroscience, Wearables Technologies, Data Driven Art, Immersive Arts, etc.

³⁶ The Center for Advanced Research Technology in the Arts and Humanities (CARTAH) was a predecessor of DXARTS which served both Arts and Humanities faculty and students. CARTAH was later absorbed by DXARTS which continued to offer its digital humanities services until 2011.

³⁷ Documentation of the DXARTS BFA termination request and approval has been added the Graduate School online drive.

- Making significant changes to our curriculum, allowing us to offer more experimental courses issued from our new areas of research. While our current curriculum preserves some of the areas which were present at the time of our 2008 program review, it now offers a wider landscape in which all these areas overlap with new ones, offering the students a more flexible and extensive learning experience which is in alignment with our current research interests.³⁸
- Investing in new infrastructure for these new research areas. This includes the upgrade of our Raitt Hall media labs, adapting them for new immersive media demands (3D audio, 4k video, VR, etc.), as well as the creation of the Art + Brain Lab (including EEG, EMG, eye tracking and many other tools). Also, we took advantage of our move out of our Fremont location to completely remodel our FabLab. Our new facility in Ballard offers a wide variety of modern digital fabrication tools (3D printers, laser cutter, CNC routers and milling machines) as well as the new SoftLab for work with e-textiles and wearable technologies. The new space also offers a dedicated gallery space as well as studio space for two faculty and the graduate students.

3) What we can improve?

Our recent experience shows us that change is not only possible but essential to DXARTS. One of the challenges for the future would be to continue to be nimble and adaptive without leaving behind a large population of students interested in a foundational media education. Another challenge would be to keep our resources up to date in the midst of the current financial crisis of the College of Arts & Sciences. These challenges are definitely related, and we see them as an opportunity for us to collaborate creatively with the College to get out of this crisis. Below are a few ways DXARTS could adapt and respond to these challenges without compromising its original mandate.

a) Teaching more foundational courses to more students

DXARTS courses attract a lot of students from all around campus and its new Minor has become extremely popular not just among students from the Arts but also in the STEM areas. We believe we could take advantage of this popularity to teach more students. We propose to do this in three steps:

1. As a first step we propose to offer our “zero” level courses (DXARTS 450, 460, 470) every quarter, this could be in place in the 2018-19 academic year and we estimate it would increase our Student Credit Hours in about 20%.

³⁸ It should be noted that the content of these courses has changed significantly as they are no longer taught by the faculty that initially created them, their syllabi have been constantly revamped to keep them relevant and up to date.

2. As a second step, we will develop an online version of our DXARTS 200 survey course. This course usually has over 100 students when is taught in the classroom every Fall, our plan is to offer it online in the Winter and Spring quarters. We believe we could get a lot more students to sign up for the online version of this course.³⁹

3. Finally, using DXARTS 200 as a pilot, we plan to develop a suite of more technical 100-level online courses focused on digital media. These courses could be offered every quarter to a large number students, using one of the online platforms currently used for MOOC instruction.⁴⁰ Based on the experience of online courses at the School of Music, we estimate we could have an enrollment close to 400 UW students taking these classes for credit, and potentially thousands of people from outside the university could take them for free or paying a fee to get a certificate.

b) Exploring synergies with other emerging units

In the last few years DXARTS has been exploring new collaborations with new units on campus. We believe these collaborations can be taken further and strong synergies could be explored between DXARTS and these units. Here are a couple of examples:

- Human Centered Design and Engineering (HCDE): this relatively new engineering unit has significant overlaps with DXARTS both in terms of research and teaching. We have recently added HCDE Assistant Professor Daniela Roesner to our Adjunct Faculty. Prof. Roesner is currently collaborating with DXARTS Assistant Professor Afroditi Psarra in the organization of a Critical Design conference to be held at the UW in the Spring. As DXARTS, HCDE offers a PhD as terminal degree, we plan to explore possible collaborations between PhD students of the two units as well as joint supervision opportunities between the faculty. We also expect to collaborate with CHDE in the creation of new experimental courses exploring the overlaps of media arts and design.⁴¹
- CoMotion: this new independent unit defines itself as a collaborative innovation hub dedicated to expanding the economic and societal impact of the UW community. DXARTS shares with CoMotion the interest in collaborative innovation; while CoMotion's mission is more related to technology transfer and DXARTS' to art and technology, we could see enough overlaps which could lead to a productive synergy, as our particular interdisciplinary mandate puts us in the perfect place to foster innovation at the UW. We have already been in contact with CoMotion's Executive Director and UW Vice President for Innovation Strategy Vikram Jandhyala to discuss possible collaborations. In an initial

³⁹ It should be noted that in 2013 DXARTS proposed to create an online version of DXARTS 200 to Professional & Continuing Education (CPE). The proposal was initially approved and we started the development of the online course but it was finally aborted by CPE.

⁴⁰ We are currently doing research on online platforms offering this kind of courses such as Kadenze: <https://www.kadenze.com>

⁴¹ Prof. James Coupe was one of the internal members of CHDE's program review committee last year.

stage we envision a possible merger of DXARTS Ballard FabLab with CoMotion's MakerSpace, both units would benefit from the combination of resources as well as from a significant reduction of their operation costs. This would also allow our PhD students to be embedded into a community of makers on-campus rather than being farther removed from the UW. Future plans include the creation of a cost center, administered by CoMotion, that could open our labs to digital media startups, and that could also include research consulting and highly qualified tech support. Fees charged for this support could help to offset the maintenance costs of our labs and to purchase new equipment for them. Finally, we also see this collaboration as an strategic opportunity for our PhD students, that could get their work out to a large tech community, which could lead to research collaborations and job opportunities.⁴²

c) Exploring collaborations with the industry

Research performed at DXARTS has high visibility. We have been recently approached by several companies—including Yamaha, Microsoft and Apple—interested in collaborating with us in technology development. While doing industrial research is not the goal of our program, we could see this as an opportunity for DXARTS to transfer innovation to a larger community while benefiting from the support—both financial and technical—that this kind of companies can offer for our research. CoMotion could be an important partner in this endeavor as they can assist us with IP protection, licensing advise as well as providing connections in the industry.⁴³

4) What would we need to do things better?

Over its short life, DXARTS has already had a remarkable trajectory that places it at the top of the ranks of similar programs across the nation. Despite this reputation and it's level of success, DXARTS continues to face some significant roadblocks within the UW. Some of these roadblocks were already brought up in the discussions of our 2008 program review and have not been addressed by the College despite clear recommendations from the review committee. We believe this is unsound policy given the level of excellence of our faculty and the success story DXARTS represents for the UW, and we urge the College to address these issues immediately before they become chronic and damaging for our unit.

a) Departmental status

One of the primary recommendations from the 2008 review committee reports reads:

“DXARTS should be elevated to full departmental status with full control of its faculty lines.

⁴² We have already started this collaborative path with a residency by DXARTS PhD student Martin Jarmick who has developed and presented VR-based artwork at CoMotion's headquarters.

⁴³ We are currently working with Lisa Norton, CoMotion's Associate Director for Technology Licensing to draft a NDA and evaluation license for a collaboration with Apple.

DXARTS has built itself into a strong independent undergraduate and graduate degree program. It has attracted strong junior faculty, post-doctoral researchers, graduate students, and undergraduate students. Its faculty currently have appointments in Music, Dance, and the School of the Arts, but not within DXARTS itself. Because sophisticated technological components play an essential role in the work of its junior faculty, decisions about promotion and tenure should be made by DXARTS faculty, who have the proper expertise to evaluate this work.”

While this statement is extremely eloquent in strongly supporting the promotion of DXARTS to a department, there are several other important issues it doesn't capture that we believe it would be good to discuss here. Every single academic appointment DXARTS makes (including postdocs, visiting artists, lecturers, etc.) needs to be voted and approved by faculty in other units. This means that we rely on the good will of faculty who have no expertise in our field to get our appointments approved. These decisions have from time to time been tinted by the politics of these other units leading to blockages or delays in the hiring process. Moreover, even after approval from the faculty, we rely on staff from those other units to get appointment letters, visas, and all other paperwork in time to get our appointees hired. This has already generated stressful situations between our administrator and staff from other units who believe they shouldn't be doing this work for us.

But this situation is even more critical for our faculty. We currently have two faculty whose home department is Dance despite their practice having very little to do with this discipline. Associate Professor James Coupe will be coming up for promotion in the near future and has not participated of faculty meetings or any other departmental activities in Dance. The work of Assistant Professor Afroditi Psarra is more related to the body and movement and she has collaborated with other faculty in Dance, but her appointment regarding her teaching, research, and service is 100% in DXARTS. This situation is even more delicate if we consider they represent a 30% of the voting faculty of a small unit like Dance, meaning they could affect decisions there if they were to use their right to vote.

DXARTS Director Juan Pampin has recently had a meeting with Dean Bob Stacey and Divisional Dean of the Arts Catherine Cole to discuss this situation. The deans expressed their optimism in getting this situation solved especially in light of the recent departmental promotions of Dance and Comparative History of Ideas (CHID).

b) Space needs

The issue of DXARTS space needs was also brought up in the 2008 review committee report:

“Unfortunately, having to pay annual rental expenditures dramatically reduces the financial resources for DXARTS that could be used to support research activities directly. Although some enjoy being in Fremont and away from the UW campus, lack of physical proximity of Fremont to

the rest of the campus creates problems for others. Ideally, a space similar to Fremont should be found near the main campus. Either the purchase of a new facility with the required open floor space, or renovation of an existing space on campus would provide solutions to address this facilities problem.”

It should be noted that things have changed dramatically since the report was written in 2008. DXARTS had to move out of its Fremont space in June 2014 when the rental agreement was up for renewal and the owner of the property requested a 50% rent increase. An alternative location of similar size (5,000 sqft) was found in Ballard where we moved in the summer of 2014. While the new rental agreement wasn't as onerous as the one demanded by our former landlord, it has an overall 13% rent increase spread over the five years of the lease. Beside the rental costs DXARTS also has to pay for all the utilities, internet, and security costs. Currently the total expenses for Ballard are around \$100K a year (around 10% of our GOF budget, these costs were estimated at \$55K in our 2008 review).⁴⁴

Our Ballard warehouse is key to our operations, it hosts our FabLab, a unique facility which is one of the reasons faculty and graduate students from around the world are attracted to come to the UW. Beside hosting our digital fabrication labs, our Ballard warehouse also provides studio space to our graduate students and two of our faculty, a classroom where many of our classes are taught, as well as an exhibition space for our graduate students.

There is an issue of fairness in this situation: DXARTS is the only art unit that has to pay for its space needs, while the other art units have their own buildings and a large amount of space on and off campus. This is also an urgent situation as we are currently at the fourth year of our lease, which ends in June 2019. DXARTS director has already brought up this issue to Divisional Dean of the Arts Catherine Cole.

An alternative we have been exploring is to merge our FabLab with CoMotion's MakerSpace at Fluke Hall.⁴⁵ This would have the advantage of bringing our fabrication tools to campus as well as our Mechatronics and other courses currently taught in Ballard. This potential solution would not take care of the space needed for studios for our graduate students and two faculty members. We propose that in case this merger moves forward the College helps us finding this extra studio space which would require about 2,000 sqft.

c) Graduate student support

The exceptional results DXARTS has had since its inception wouldn't have been possible without research support and in particular without graduate student support. The cost of Academic Student Employees (ASEs) has increased by about 30% in the last few years after

⁴⁴ It should be noted that the costs of remodeling the new Ballard space and the move were also significant (over \$10K). Most of these costs we covered with our RCR (research) budget.

⁴⁵ It should be noted that this move wouldn't be without ongoing cost as CoMotion will expect us to pay a yearly fee to have access to this space.

the ASEs unionized. This increasing cost has been gradually absorbed by DXARTS, as the College has not provided additional funds to cover these increases and at the same time has decreased its Temporary Instructional Funds (TIF) allocations by almost 50% every year. This has been catastrophic for DXARTS as we have now to rely almost completely on our General Operating Funds (GOF) to hire TA's and GSA's at a higher cost, forcing us to bring in less students into our PhD program. With the current costs we can't afford to accept more than two PhD students to our program a year, limiting our graduate student cohort to about eight students, while in the past we had cohorts of twelve or fifteen students. This situation has had an impact on both our research and our teaching capabilities.

We believe that our PhD students could provide significant revenue to the College as they come to us with Masters degrees and are ready to solo teach courses as soon as they get here. It would be a great investment for the College to fund more graduate students in DXARTS in particular now that a hiring freeze has been announced, which means no new faculty hires will happen in DXARTS in the near future. We propose that DXARTS could team-up with the College to fund an extra ASE position every year, that way we could increase our PhD cohort to twelve students allowing us to teach more foundations courses and even new online courses (see section 3-a "Teaching more foundational courses to more students").

d) Grant application and administration support

In the last few years DXARTS has been extremely successful in obtaining external funds both from federal and private organizations. We believe we are now in a position where a constant stream of external grant support could be achieved. The bottleneck here is that, unlike other units on campus, we don't have a dedicated staff member who could take care of helping us find and write these grants. The College could significantly benefit from providing this kind of support as some of these grants could cover the costs of TAs and even faculty. We propose that with the help of the College, DXARTS could fund a 50% FTE position dedicated to grant writing and administration.

e) New faculty lines

DXARTS currently has four full-time faculty of which two have important administrative appointments. With the appointments of Prof. Karpen as Director of the School of Music and of Prof. Juan Pampin as Director of DXARTS, our program has lost significant teaching support. DXARTS has also lost a junior faculty position when Stephanie Andrews left the UW in the midst of the 2009 economic crisis and the university was under a state-mandated hiring freeze. Later, we lost a senior faculty position when Shawn Brixey left the the UW in June 2013. Of these two faculty positions we only recovered the junior faculty one, when Afroditi Psarra was

hired last year, but the funding from Brixey's position (\$90K) has gone back to the Dean's office

⁴⁶

We believe DXARTS needs two extra faculty lines to operate at its full teaching capacity again, our department could produce enough Student Credit Hours to become self-sustaining with these new lines. These lines are also crucial for a generational renovation of DXARTS, as in ten years from now most of our faculty will be senior and our most senior faculty will be approaching retirement. There is also a matter of gender balance in our faculty which could be addressed with the appointment of two new faculty.

We are aware of the current financial crisis the College of Arts & Sciences, and of the plans of implementing a hiring freeze which could put this request on hold. But we should think strategically and look into the future rather than to only focus on the current circumstances, which we believe can be overturned with our collective effort.

5) Where would we want to be in 10 years from now?

Richard Karpen:

In order to consider my own vision for DXARTS in ten years, I find it useful to remind myself why DXARTS was founded and funded at the UW, to question whether this is still of high value, and to consider how the program could evolve while keeping the its founding principles at its core as it changes.

DXARTS was founded based on three primary principles.

1. To ensure that the UW would have a program charged with the mission to engage in rigorous artistic research at the forefront of rapidly developing advanced emerging technologies.
2. To be highly interdisciplinary and in the context of the UW to be inter-college in its collaborations.
3. To recognize that if the only terminal degree for artists were an MFA, then two reasons for this are possible: either no artistic practice requires as many years of mentored graduate study as the Natural and Social Sciences, and the Humanities, or that we simply do not offer the same kinds of opportunities to artists to study post-MFA that we offer all others.

It's gratifying to observe after all these years, that DXARTS still fulfills these core principles and that they seem more relevant than ever. Our new faculty hire and our PhD candidates offer us exciting windows into the future. Even while shrinking in terms of number of tenure track faculty,

⁴⁶ These funds were used to pay for a temporary Visiting Associate Professor position for two years in 2013-2015.

the program has expanded in its scope to include areas such as, neuroscience, big data, virtual reality, machine-human interactivity. These areas of research and artistic practice are being pursued through deep collaborations with key faculty and industry partners from UW Medicine, Electrical Engineering, Human Centered Design as well as Swedish Hospital, Apple Computer, Microsoft, Yamaha, and others. The program continues to attract remarkable PhD students from around the world who elevate the discourse in the Arts and in other areas of the UW.

DXARTS has had a unique trajectory to prove to the UW and to our peer institutions that such a program could fulfill its core principles and keep contributing to the institutional enterprise in unique ways. The program evolved over many years from separate labs in Art, Music, Engineering, to the innovations of CARTAH that led to the Tools for Transformation pilot and then to the successful UIF process that founded DXARTS. The last formal program review confirmed that the rigorous, self-critical, and inclusive path of the program warranted making the it permanent.

So where would I like to see DXARTS ten years from now? I hope that we will want to and that we will be able to base the future of DXARTS on the same founding principles that still serve the program and the University so well. We will continue to make important discoveries, and to teach the next generation of advanced artists while bringing new, as yet un-envisioned, and powerful experiences to audiences here and around the world. I would like to see us continue to provide emerging artists with the same kinds of opportunities for advancement in their practice and research at the PhD level that are the norm across the rest of the UW.

We can only guess what the scientific and technological advances will be that DXARTS students and faculty will be integrating into their own research and practice as artists in ten years. My own guesses concern the new ways to explore the inner and outer worlds that we inhabit. We will go much deeper into understanding our bodies, especially the brain and nervous system; and we will explore in greater depth the potentials of virtual social communities. We will also stay mindful of traditional practices of performing and fine arts to keep us grounded as artists.

Finally, I believe it is imperative that DXARTS be granted Departmental Status to be able to make faculty appointments of all ranks, be they tenure-track, lecturers and Artists in Residence, part time faculty, research associates, adjuncts, or affiliates. The current status creates unnecessary and unwise impediments to DXARTS' ability to serve the UW with continued excellence.

James Coupe:

DXARTS is an incubator for artists to experiment with emerging media and technologies. Up until now, DXARTS has focused upon Music and Visual Art as its principle areas of concentration. Over the next ten years, I would like to see that the balance between these two areas of concentration is carefully maintained. This will mean the hiring of additional faculty in the visual arts area (with studio-based PhDs), the establishment of permanent studio and

production space (ideally on-campus), and an open dialog between emerging ideas in contemporary art and the research and teaching that happens at DXARTS (potentially aided by the hiring of a history/theory faculty member).

Music and Visual Art root DXARTS to a history of ideas, methodologies and critical vocabularies that go far beyond any particular technology or set of materials. Hence, it is important for us to retain a healthy agnosticism towards the technologies we use, in order to ensure that we keep taking risks and experimenting. For example, one measure of success may be that by 2027, we are not teaching any of the classes that we currently teach (most of which we have been teaching for the last ten years). In 2027, I would like to see that DXARTS has had sufficient impact across campus to encourage the School of Art and the School of Music to adopt stock (2017) DXARTS classes, freeing us up to continue to push the boundaries of what art can be. Over the next ten years, technology will shift radically and dynamically. I see DXARTS' role as working at the forefront of this shift, constantly examining the artistic implications of emerging media. This requires funding to purchase such technologies, technical support to work with them, physical space to explore them, and the freedom to develop classes and research that use them.

When DXARTS first began its PhD program, there were few, if any competitors. Over the last few years, new programs including those at RPI, Brown, Harvard, and CalArts have emerged. In some cases these programs are located near to more desirable art-centers than Seattle, and as a result we have found ourselves having to compete for students. As these, and other, programs invest in faculty, buildings and infrastructure, it is important that DXARTS keeps pace through similar levels of investment. DXARTS has always used its institutional position as an advantage: we are not part of a larger school or department, and as a result can be flexible and agile, and offer our students a truly interdisciplinary experience. We must keep our offerings and our research fresh and meaningful, and maintain dialogues between our research and contemporary art in general. We must constantly innovate and make risk-taking the norm. If I were still at DXARTS in ten years, I would want it to be unrecognizable, beyond anything I could possibly have predicted in 2017.

Lastly, the role that DXARTS plays within the wider UW academic mission should be examined. When it was created, DXARTS had a mandate to explore interdisciplinarity in the Arts. While interdisciplinarity is a word that many academic departments like to use, DXARTS was founded upon it. Over the last fifteen years, DXARTS has achieved a great deal, despite its small size and small budget relative to the University's other interdisciplinary flagships. In that fifteen years, many of the things that DXARTS has pioneered and promoted – such as creative coding, maker culture, and virtual reality – have become integrated into multiple units and centers around campus. DXARTS is no longer the only place at the UW with 3D printers, laser cutters, Arduino classes, etc. Consequently, DXARTS is at a threshold, where it needs to reinvent itself, with the support of the University. In ten years, we should again be saying that multiple units around campus have adopted innovations that were first incubated at DXARTS. The value of DXARTS is demonstrated by the fact that this has happened already; for it to be regularly

repeated will require the UW to take DXARTS seriously and provide it with the faculty, space and infrastructural support it needs to achieve this.

Afroditi Psarra:

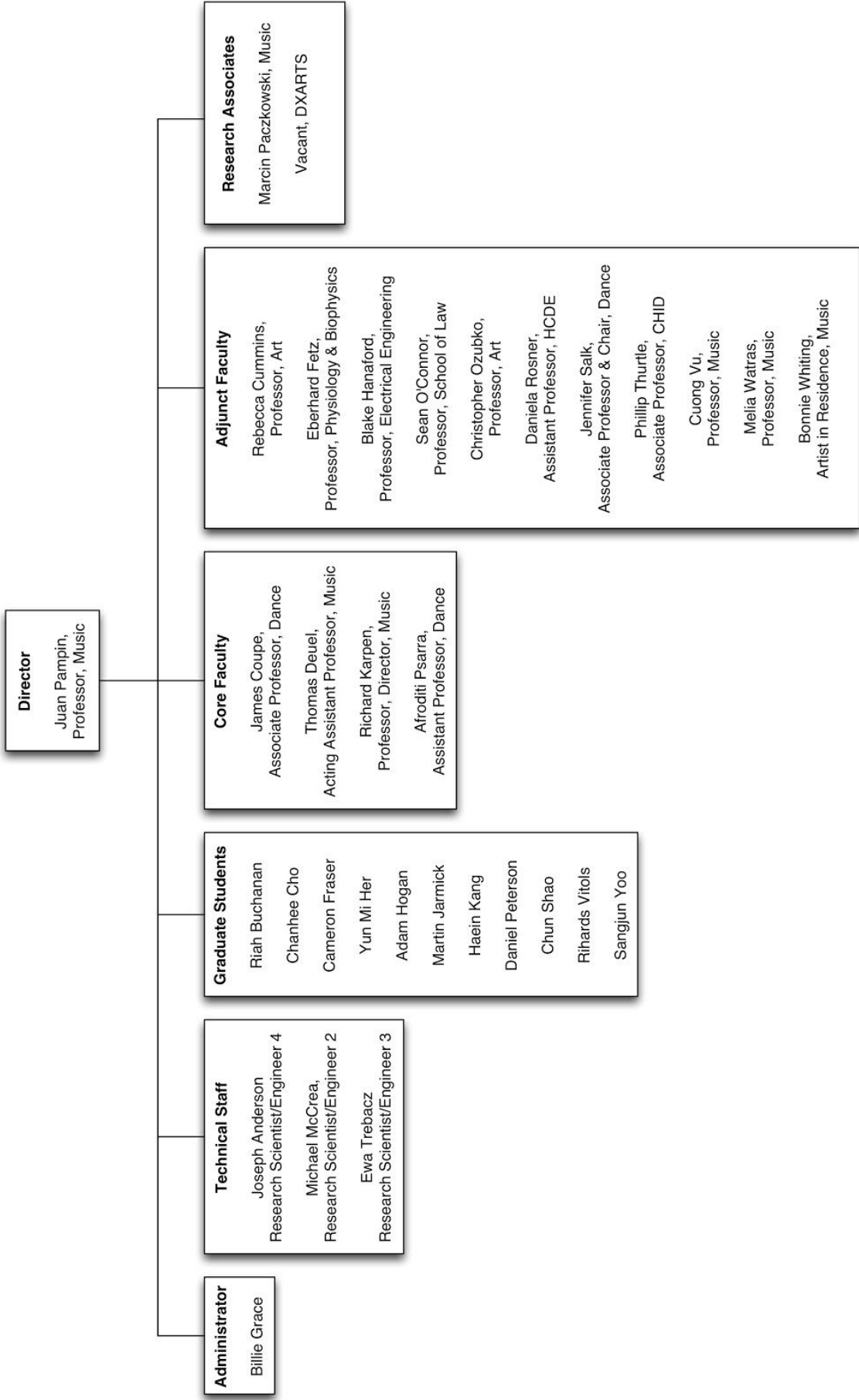
In ten years I envision DXARTS having grown in size, being able to support at two more permanent faculty positions, and having twice the amount of graduate students. Given that the above would be realized, I would like to see DXARTS developing a competitive Master's program that will attract talented and motivated emerging artists from across the globe.

On a personal level I would like to have created my own track on Media Performance within the program's curriculum, as well as a significant number of new seminar classes with an interdisciplinary character - combining the Arts and Humanities with Science and Engineering. I expect to have realized a number of collaborative research projects with faculty and students, bridging our department's expertise in Ambisonics with my expertise in the field of electronic textiles and wearable computing. Furthermore, I envision having organized a number of conferences/symposiums/events centered around DXARTS core fields of research, by collaborating with faculty from other departments and by inviting prestigious researchers and scholars at the University of Washington. Moreover, I would like to see the SoftLab grow in a research group with a permanent post-doc, or artist-in-residence position, that together with graduate students will conduct cutting edge research and artwork in the field, participating in collaborative art projects, paper publications etc.

All in all, I envision personal and professional growth, as well as enhancing the departments' resources and facilities.

Appendix A: DXARTS Organization Chart

The chart on the next page depicts DXARTS' organizational structure. The job titles of the staff were included for reference as well as the academic affiliations of our Core and Adjunct Faculty.



Appendix B: DXARTS Budget Summary

Approximate Income and Expenses Biennium 17 (July 2015 - June 2017)

Revenue:

College Allocations: \$2,522,854

Endowments: \$72,082

Gifts: \$16,778

Grants: \$80,000

Lab Fees: \$81,104

STF: \$193,606

Other: \$176,099

Total: \$3,142,523

Expenses:

Operations: \$196,046

Fablab: \$187,788

Personnel (includes: faculty, staff, TA/RA, hourly salaries & benefits): \$2,325,126

Research: \$253,025

Total: \$2,961,985

Approximate Income and Expenses Biennium 15 (July 2013 - June 2015)

Revenue:

College Allocations: \$2,685,763

Endowments: \$19,583

Gifts: \$20,783

Lab Fees: \$63,782

STF: \$83,152

Other: \$104,972

Total: \$2,978,035

Expenses:

Operations: \$283,571

Fablab: \$195,368

Personnel (includes: faculty, staff, TA/RA, hourly salaries & benefits): \$2,080,603

Research: \$154,342

Total: \$2,713,884

Approximate Income and Expenses Biennium 13 (July 2011 - June 2013)

Revenue:

College Allocations: \$2,705,345

Endowments: \$67,815

Gifts: \$27,489

Grants: \$10,824

Lab Fees: \$60,429

STF: \$3,008

Other: \$92,096

Total: \$2,967,006

Expenses:

Operations: \$384,409

Fablab: \$169,166

Personnel (includes: faculty, staff, TA/RA, hourly salaries & benefits): \$1,811,524 □

Research: \$197,277

Total: \$2,562,376

Appendix C: DXARTS Faculty Information

Core Faculty

James Coupe

Associate Professor (regular; tenured)

Donald E. Peterson Endowed Fellowship for Excellence

Center for Digital Arts & Experimental Media, Department of Dance

CV: <https://dxarts.washington.edu/file/1220/download?token=XQaA6S0d>

Thomas Deuel

Acting Assistant Professor (fixed term)

Center for Digital Arts & Experimental Media, School of Music

CV: <https://dxarts.washington.edu/file/1221/download?token=YPbuy9IC>

Richard Karpen

Professor (regular; tenured)

Aura Bonell Morrison Endowed Professor

Center for Digital Arts & Experimental Media, School of Music

Director, School of Music

CV: <https://dxarts.washington.edu/file/1222/download?token=eervY5e->

Juan Pampin

Professor (regular; tenured)

Waters Endowed Professor

Center for Digital Arts & Experimental Media, School of Music

Director, Center for Digital Arts & Experimental Media

CV: <https://dxarts.washington.edu/file/1223/download?token=yLEMZYJm>

Afroditi Psarra

Assistant Professor (fixed term)

Center for Digital Arts & Experimental Media, Department of Dance

CV: <https://dxarts.washington.edu/file/1224/download?token=qt34ZKpS>

Adjunct Faculty

Rebecca Cummins

Professor (regular; tenured)

School of Art, Art History & Design

Eberhard Fetz
Professor (w/o tenure)
Department of Physiology & Biophysics
Adjunct Professor, Bioengineering, School of Medicine

Blake Hannaford
Professor (regular; tenured)
Department of Electrical Engineering, School of Engineering
Adjunct Professor, Bioengineering, School of Engineering

Sean O'Connor
Professor (regular; tenured)
Boeing International Endowed Professor
School of Law

Chris Ozubko
Professor (regular; tenured)
School of Art, Art History & Design

Daniela Rosner
Assistant Professor (fixed term)
Department of Human Centered Design & Engineering,
School of Computer Science & Engineering

Jennifer Salk
Associate Professor (regular; tenured)
Floyd and Delores Jones Endowed Chair,
Department of Dance

Phillip Thurtle
Associate Professor (regular; tenured)
Center for Comparative History of Ideas,
Department of History

Cuong Vu
Professor (regular; tenured)
Donald E. Peterson Endowed Professor
School of Music

Melia Watras
Professor (regular; tenured)

Adelaide D. Currie Cole Endowed Professor
School of Music

Bonnie Whiting
Artist In Residence (fixed term)
School of Music

Emeritus Faculty

Paul Berger
Professor Emeritus (retiree; regular; part-time)
School of Art, Art History & Design

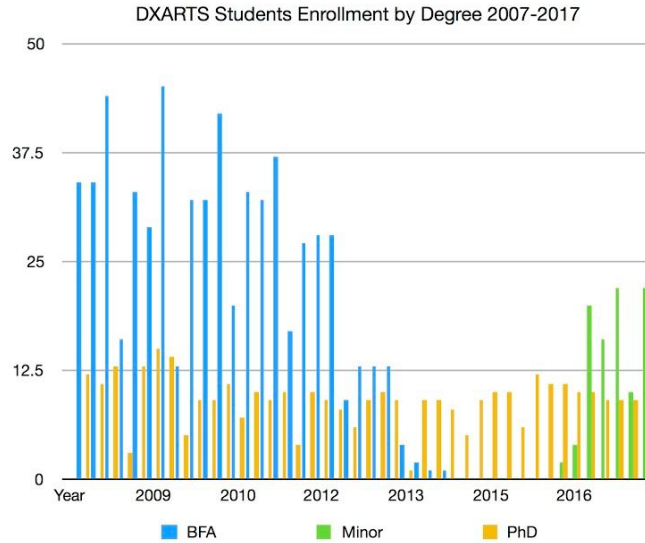
Stuart Dempster
Professor Emeritus (retiree; regular; part-time)
School of Music

Postdoctoral Researcher

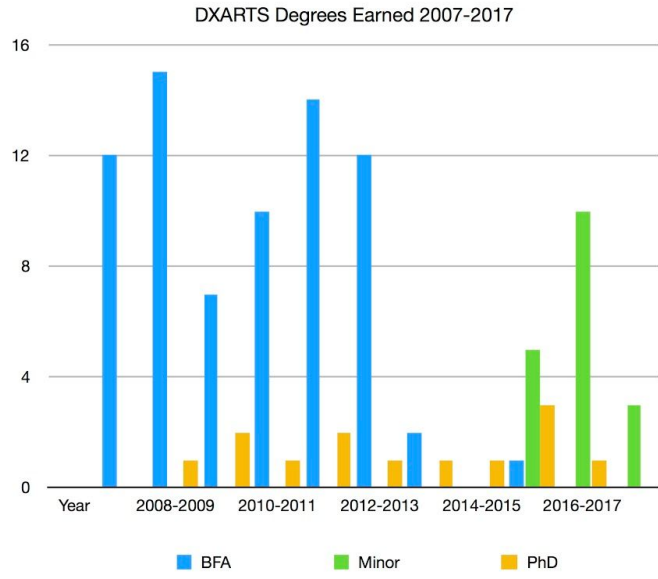
Marcin Paczkowski
Research Associate (fixed term)
School of Music

Appendix C: Enrollment and graduation patterns

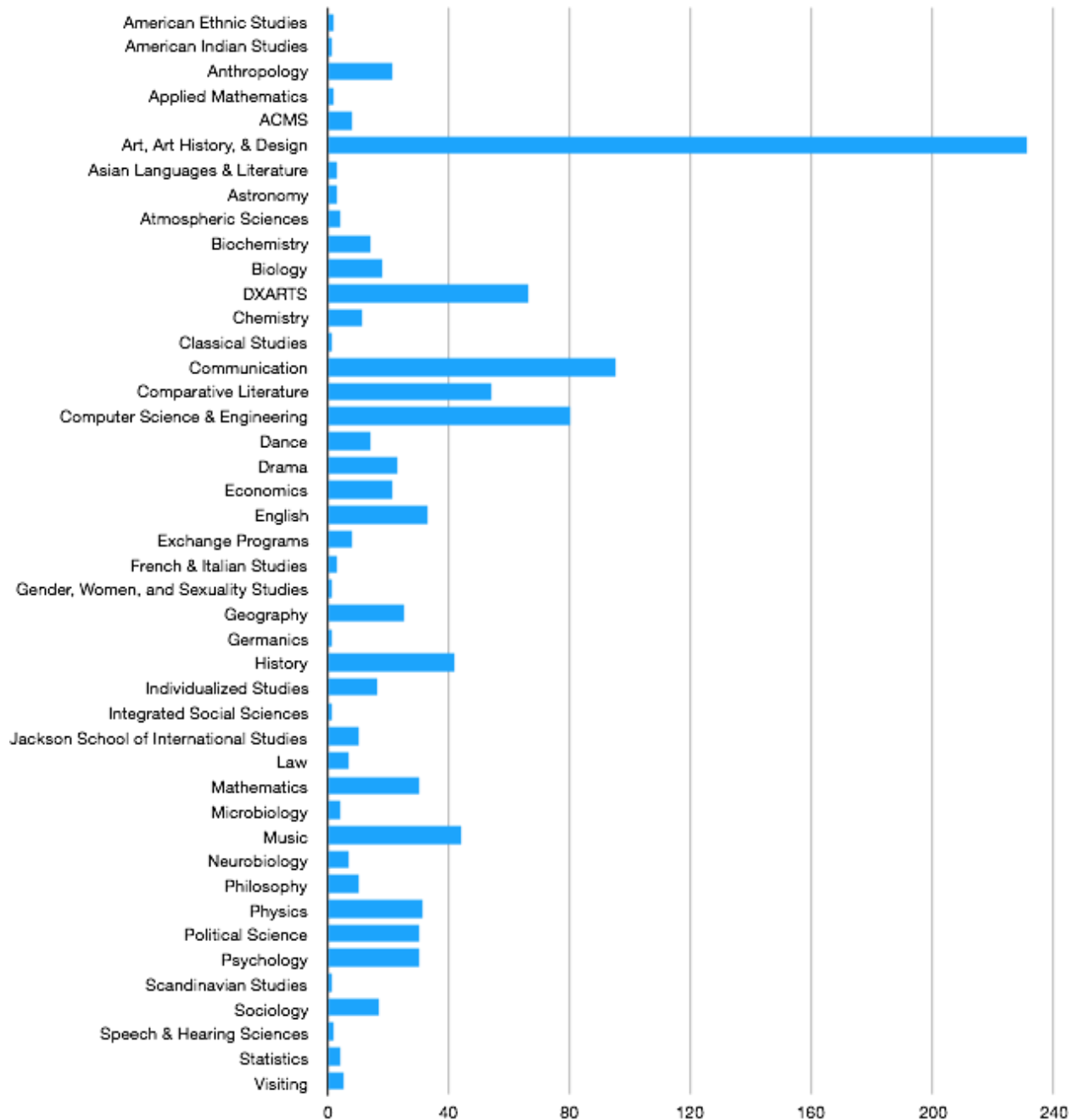
Year	BFA	Minor	PhD	Total
AUT 2007	34		12	46
WIN 2008	34		11	45
SPR 2008	44		13	57
SUM 2008	16		3	19
AUT 2008	33		13	46
WIN 2009	29		15	44
SPR 2009	45		14	59
SUM 2009	13		5	18
AUT 2009	32		9	41
WIN 2010	32		9	41
SPR 2010	42		11	53
SUM 2010	20		7	27
AUT 2010	33		10	43
WIN 2011	32		9	41
SPR 2011	37		10	47
SUM 2011	17		4	21
AUT 2011	27		10	37
WIN 2012	28		9	37
SPR 2012	28		8	36
SUM 2012	9		6	15
AUT 2012	13		9	22
WIN 2013	13		10	23
SPR 2013	13		9	22
SUM 2013	4		1	5
AUT 2013	2		9	11
WIN 2014	1		9	10
SPR 2014	1		8	9
SUM 2014	0		5	5
AUT 2014			9	9
WIN 2015			10	10
SPR 2015			10	10
SUM 2015			6	6
AUT 2015			12	12
WIN 2016			11	11
SPR 2016		2	11	13
SUM 2016		4	10	14
AUT 2016		20	10	30
WIN 2017		16	9	25
SPR 2017		22	9	31
SUM 2017		10	9	19
AUT 2017		22	11	33
Grand Total	632	96	375	1103

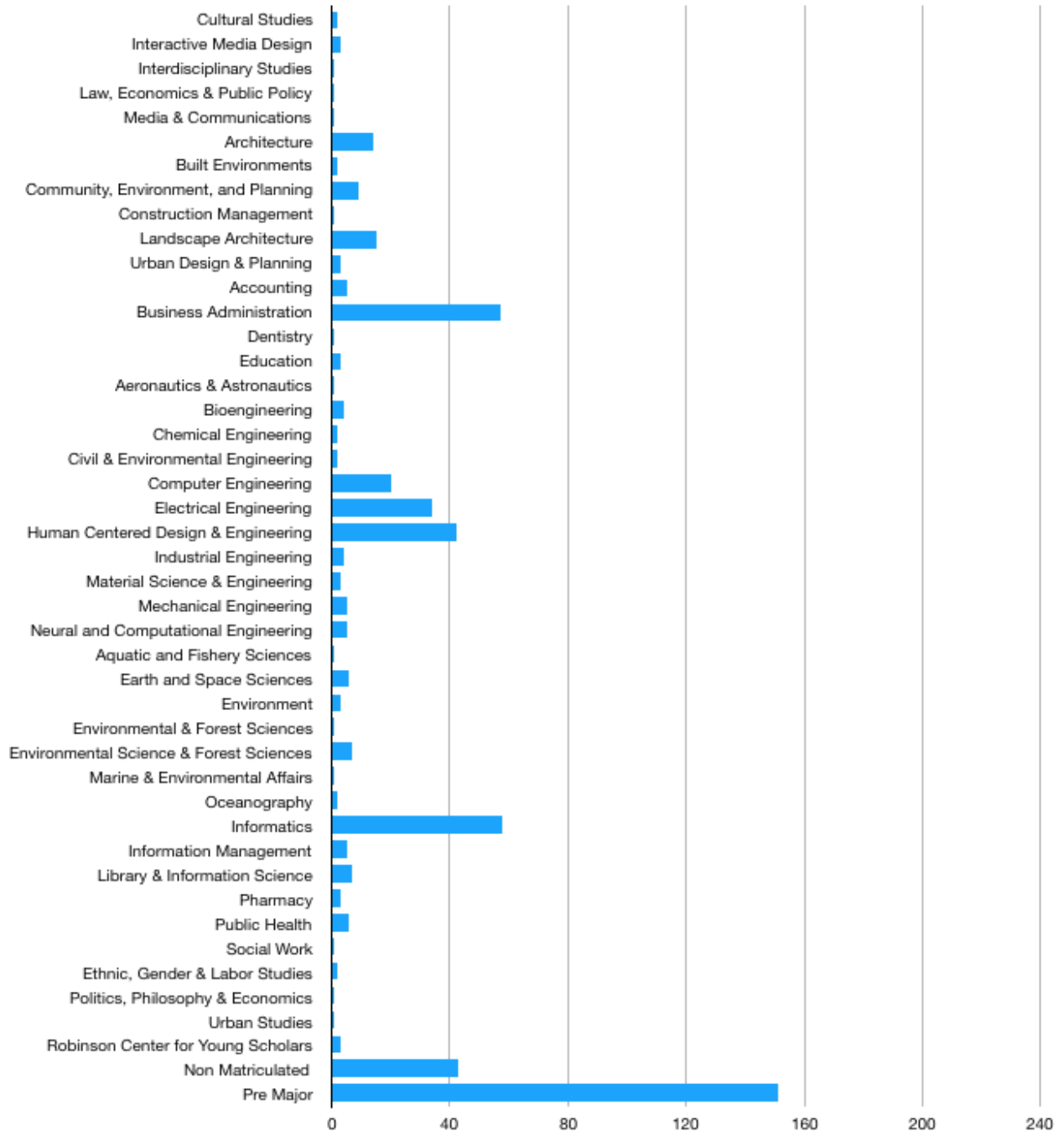


Year	BFA	Minor	PhD	Total
2007-2008	12	0	0	12
2008-2009	15	0	1	16
2009-2010	7	0	2	9
2010-2011	10	0	1	11
2011-2012	14	0	2	16
2012-2013	12	0	1	13
2013-2014	2	0	1	3
2014-2015	0	0	1	1
2015-2016	1	5	3	9
2016-2017	0	10	1	11
AUT 2017	0	3	0	3

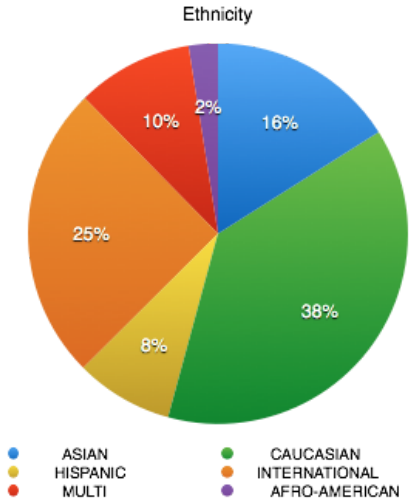
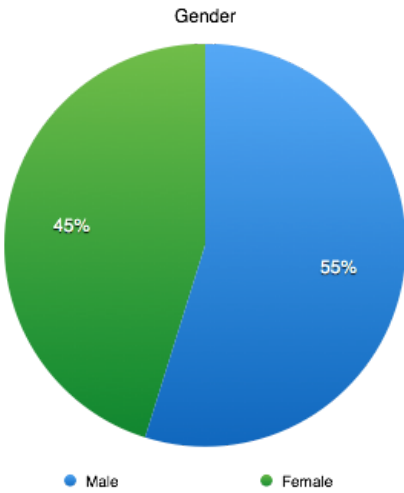
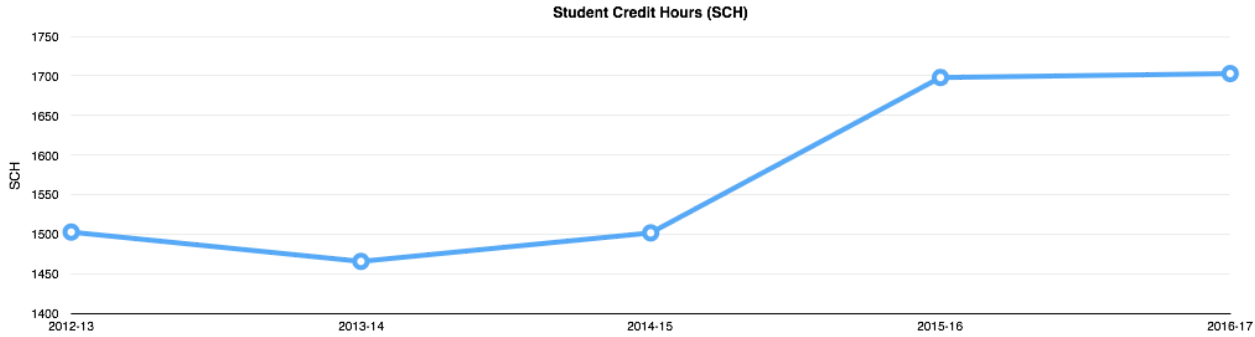


Appendix D: Students in DXARTS Courses by Major 2013-2017





Appendix E: DXARTS Student Credit Hours and Student Demographics 2013-2017



Appendix F: Selected Media Articles 2013-2017

The list below is a compilation of selected media articles from the last five years profiling DXARTS, its faculty and students. Please visit our online news archive for a complete list of DXARTS announcements: <https://dxarts.washington.edu/news/archive>

NEA publishes article about DXARTS music and brain research

On October 26, 2017, Rebecca Sutton from the National Endowment for the Arts (NEA) wrote an article for the Art Works blog featuring DXARTS music and brain research supported by an NEA Creativity Connects grant.

Link: <https://www.arts.gov/art-works/2017/musical-instrument-thats-making-brain-waves>

Newsweek and Mic Encephalophone articles

Two articles on Thomas Deuel's Encephalophone have been published in Newsweek and Mic Magazine in July 2017.

Newsweek:

<http://www.newsweek.com/power-mind-you-can-play-instrument-using-just-your-thoughts-636280>

Mic :

<https://mic.com/articles/182114/scientists-figured-out-a-way-to-let-you-compose-music-using-just-your-brain>

DXARTS on KOMO-TV

On Sunday, June 18th, 2017, ABC affiliate KOMO TV aired a UW 360 segment featuring DXARTS. UW 360, hosted by Carolyn Douglas, is an Emmy-award winning news magazine show that features stories about the University of Washington.

Link: <http://uwtv.org/series/uw360/watch/ppESfaQIk2c/>

DXARTS on the cover of The Seattle Times

DXARTS “Performing with the Brain” project, supported by a \$80K Creativity Connects grant from the National Endowment for the Arts was the subject of a long article by Brendan Kiley from the Seattle Times. This article appeared on the cover of the paper edition of Sunday, March 26, 2017.

Link:

<https://www.seattletimes.com/entertainment/music/brain-music-encephalophone-neurology-university-washington-dxarts/>

UW Perspectives Newsletter: A Marriage of Art and Neuroscience

Nancy Joseph described the DXARTS 490 course “Art and the Brain” in her article published in August 2016 UW Perspectives Newsletter, the article appeared on the cover of the newsletter which goes out to all the faculty of the College of Arts & Sciences.

Link:

https://artsci.washington.edu/news/2016-08/marriage-art-neuroscience?utm_source=perspectives&utm_medium=email&utm_campaign=Aug-16

UW Perspectives Magazine: Marcin Pączkowski. A Marriage of Music and Motion

DXARTS PhD students Marcin Pączkowski appeared on the cover of the March 2016 UW Perspectives Magazine. Marcin’s work was featured in an article by Nancy Joseph titled “A Marriage of Music and Motion”.

Link:

https://artsci.washington.edu/news/2016-03/marriage-music-and-motion?utm_source=perspectives&utm_medium=email&utm_campaign=Mar-16

James Coupe's “General Intellect” reviewed by The Stranger

On September 23, 2015, James Coupe's piece “General Intellect” was reviewed by Jen Graves from The Stranger in her article “Meet the New Boss: You”.

Link:

<http://www.thestranger.com/visual-art/features/2015/09/23/22896726/meet-the-new-boss-you>

Microsoft blog "The Fire Hose" features DXARTS PhD student Robert Twomey

On Jun 18, 2015 the Microsoft blog "The Fire Hose" featured DXARTS graduate student Robert Twomey. The article, "Artist Robert Twomey explores the intersection of humans and machines", written by Vanessa Ho, is a profile of the artist and describes his work as well as his artistic approach.

Link:

<https://blogs.microsoft.com/firehose/2015/06/18/artist-robert-twomey-explores-the-intersection-of-humans-and-machines/>

DXARTS profiled in The Stranger

On December 10, 2014, an extensive article profiling DXARTS was published on the paper edition The Stranger's quarterly magazine, Seattle Art and Performance. This magazine, is the largest circulated arts publication in the Northwest and is the definitive guide to the Seattle arts season.

Link:

<http://www.thestranger.com/seattle/what-only-artists-can-teach-us-about-technology-data-and-surveillance/Content?oid=21162466>

DXARTS on the cover of The Seattle Times' Pacific NW magazine

DXARTS was the subject of a long article by Seattle Times arts critic Michael Upchurch which appeared on the Sunday, March 23, 2014, issue of the Pacific Northwest Magazine. The article, titled "Art Through Fusion", appeared on the cover of the magazine.

Link:

<https://www.seattletimes.com/pacific-nw-magazine/the-uw-mixes-art-and-science-with-worldwide-talent/>

James Coupe's "Swarm" reviewed by The Toronto Star

On September 5, 2013, Murray Whyte, visual arts critic of the The Toronto Star, wrote a review of the "David Cronenberg: Transformations" show at the Museum of Contemporary Canadian Art including James Coupe's "Swarm".

Link:

https://www.thestar.com/entertainment/visualarts/2013/09/05/david_cronenberg_transformation_at_mocca.html

“Sanctum” reviewed by the Seattle Weekly

On June 25, 2013, Sanctum by James Coupe and Juan Pampin was reviewed by Seattle Times arts critic Brian Miller.

Link:

<http://archive.seattleweekly.com/home/947372-129/sanctum-facebook-henry-art-coupe-project>

“Sanctum” reviewed by The Stranger

On June 25, 2013, “Sanctum” by James Coupe and Juan Pampin was reviewed by The Stranger arts critic Jen Graves.

Link: <https://www.thestranger.com/seattle/is-it-safe/Content?oid=16764877>

UW Perspectives: Public And Provocative: Sanctum At The Henry

An article appearing in the May 2013 issue of the College of Arts & Sciences' Perspectives magazine explores the technology and creative process behind the scenes of “Sanctum”, an installation at the Henry Art Gallery created by DXARTS faculty Juan Pampin and James Coupe.

Link: <https://artsci.washington.edu/news/2013-05/public-and-provocative-sanctum-henry>

Appendix G: Selected Programmatic Activities 2011-2017

Year	Event	Artist(s)	Venue	Dates
2017	Music of Today: Jonty Harrison's Voyages (concert)	Jonty Harrison	Meany Hall (UW)	November 28, 2017
2017	Music of Today: Intercontinental Experimental Music Ensemble (concert)	Garth Knox, Nguyễn Thanh Thủy, Juan Pampin, Richard Karpen, Cuong Vu, Ted Poor, Stomu Takeishi, Stefan Östersjö, Bonnie Whiting	Meany Hall (UW)	October 25, 2017
2017	Music of Today: UW Alumni Composers (concert)	Linda Antas, Nicolás Varchausky, Ben McAllister, Bret Battey, Ewa Trebacz, Donald Craig	Meany Hall (UW)	May 12, 2017
2017	Music of Today: DXARTS Spring Concert (concert)	Richard Karpen, Juan Pampin, Stuart Dempster	Meany Hall (UW)	April 6, 2017
2017	Music of Today: Music Y: New Works by Emerging Artists (concert)	Daniel Peterson, Marcin Paçzkowski, Cameron Fraser, Daniel Webbon, Adam Hogan, Kaley Eaton, Wei Yang	Meany Hall (UW)	February 21, 2017
2016	Music of Today: DXARTS, Indigo Mist (Phase II)(concert)	Cuong Vu, Ted Poor, Stomu Takeishi, Nguyễn Thanh Thủy, Richard Karpen, Juan Pampin	Floyd and Delores Jones Playhouse (UW)	November 17, 2016
2016	Windward Windword: Works by DXARTS Phd Students Joel Ong and Inmi Lee (exhibition)	Joel Ong, Inmi Lee	Jacob Lawrence Gallery (UW)	July 14 - August 6, 2016
2016	Musica Electronica (concert, in collaboration with the Seattle Modern Orchestra)	Seattle Modern Orchestra	Chapel Performance Space at Good Shepherd Center, Seattle	April 9, 2016

2016	Music of Today: Digital Music in 3D (concert)	Oscar Pablo Di Liscia, Natasha Barret, Juan Pampin, Marcin Pączkowski	Meany Hall (UW)	April 7, 2016
2016	Music of Today: Garth Knox (concert)	Garth Knox	Meany Hall (UW)	February 22, 2016
2015	Music of Today: Listening Beyond... (concert)	Elainie Lillios, Martin Jarmick, Perry Jones, Daniel Peterson	Meany Hall (UW)	November 20, 2015
2015	Art World Systems: Network, Medium, Platform (lecture)	Francis Halsall, Kris Cohen, and Johanna Gosse in conversation	Smith Hall 102 (UW)	November 6, 2015
2015	Music of Today (concert)	Ensemble Dal Niente	Meany Hall (UW)	October 30, 2015
2015	Music of Today: The Music of Harry Partch (concert)	UW School of Music Harry Partch Ensemble, Charles Corey, Director	Meany Studio Theater (UW)	May 26, 2015
2015	Music of Today (lecture/performance)	Harry Partch Instruments Presentation	Meany Hall (UW)	May 11, 2015
2015	Improvised Music Project Festival VII (concert)	Chong Vu, Richard Karpen, Juan Pampin, Ted Poor, Bill Frisell, Steve Swallow, Chris Cheek	Ethnic Cultural Theater (UW)	May 1, 2015
2015	Music of Today: The Music of Jonty Harrison (concert)	Jonty Harrison	Meany Hall (UW)	April 9, 2015
2015	...that language is shaped air... (performance, presented as part of Ann Hamilton show "The common SENSE")	Seattle Chamber Players, Cuong Vu, Richard Karpen, Ted Poor, Stuart Dempster, Juan Pampin	Henry Art Gallery, Seattle	March 20, 2015
2014	Surveillance & Privacy: Art, Law, and Social Practice Symposium (lecture, presented in collaboration with the Henry Art Gallery)	Marc Rotenberg	Kane Hall (UW)	November 20, 2014

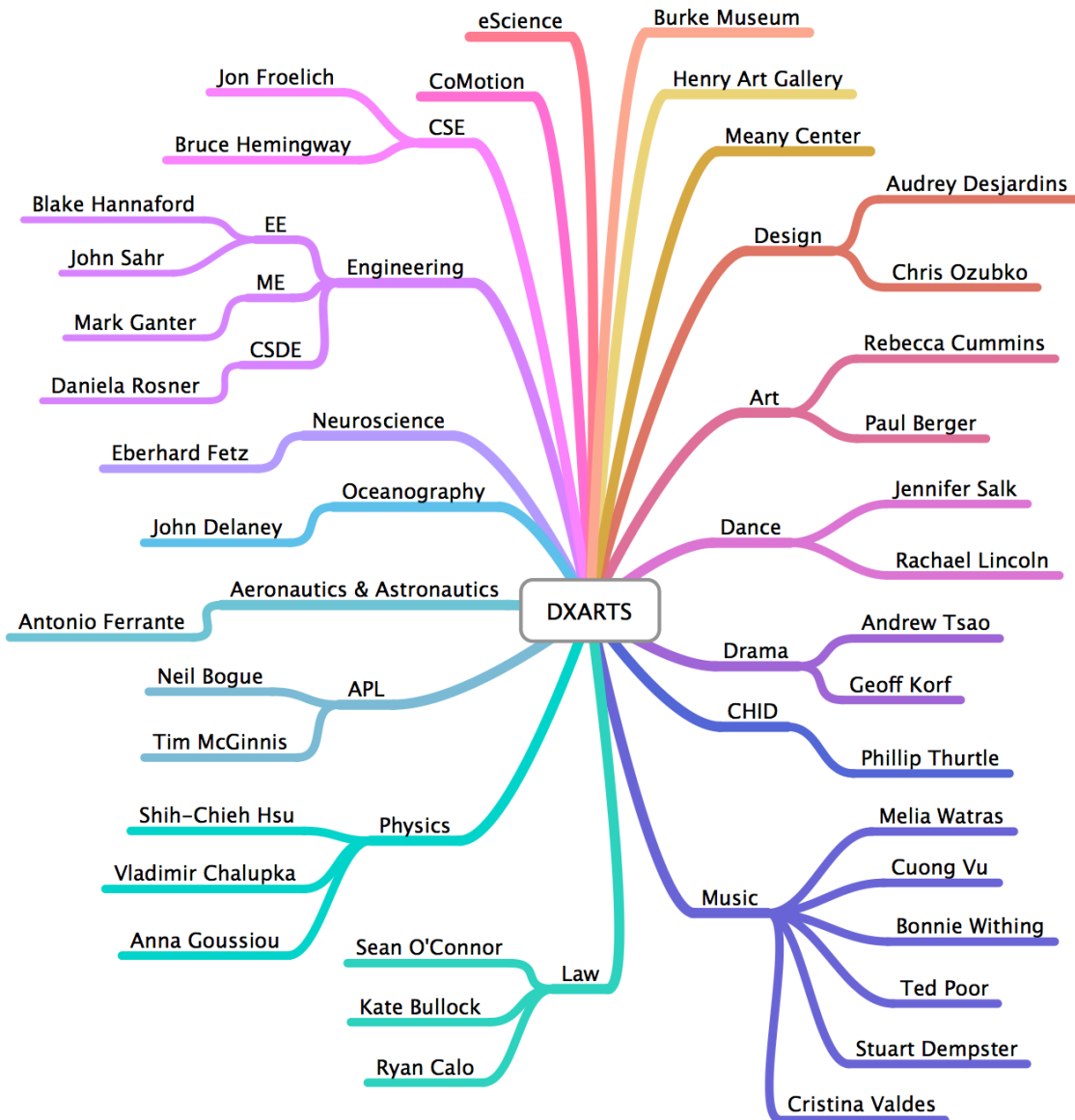
2014	Music of Today: Through a glass, darkly, electroacoustic music in 3D (concert)	Richard Karpen, Perry Jones, Daniel Peterson, Marcin Pączkowski, Nicolás Varchausky, Joseph Anderson	Meany Hall (UW)	November 13, 2014
2014	Surveillance & Privacy: Art, Law, and Social Practice Symposium (lecture, presented in collaboration with the Henry Art Gallery)	Cory Doctorow	Kane Hall (UW)	October 25, 2014
2014	Music of Today: Experimental Improvised Music in 3D (concert)	Richard Karpen, Cuong Vu, Luke Bergman, Ted Poor, Stuart Dempster, Greg Sinibaldi, Joseph Anderson, Juan Pampin	Meany Hall (UW)	April 17, 2014
2014	An Evening With The JACK Quartet (concert, in collaboration with Meany World Series)	JACK Quartet, The Six Tones, Richard Karpen, Juan Pampin, Mirta Wymerszberg	Meany Studio Theater (UW)	March 15, 2014
2014	Music of Today: The Music of Luigi Nono (concert)	André Richard	Meany Hall (UW)	February 25, 2014
2013	Music of Today: An Evening of Electro-Acoustic Music (concert)	Walter Ruttman, Richard Karpen, Pete Stollery, Pierre Schaeffer, Matthew Barnard, Joseph Anderson	Meany Hall (UW)	November 14, 2013
2013	Music of Today: Garth Knox (concert)	Garth Knox	Meany Hall (UW)	October 22, 2013
2013	Sanctum (public installation)	James Coupe, Juan Pampin	Henry Art Gallery, Seattle	Exhibited from May 2013 though June 2015
2013	DXARTS BFA Senior Thesis Exhibition	Sarah Arnegard, Daniel Chesney, Anna Hayden, Martin Jarmick, Reed Juenger, Juliana Meira Do Valle, Collin Schupman, Evangeline Spracklin, Bennett Schatz, Kendra Stout, Jenn Swanson	Jacob Lawrence Gallery (UW)	May 14, 2013

2013	Music of Today: Experimental Improvised Music (concert)	Luke Bergman, Richard Karpen, Juan Pampin, Cuong Vu, Matt Ingalls, Greg Sinibaldi	Meany Hall (UW)	May 9, 2013
2013	Music of Today: The 21st Century Piano (concert)	Cristina Valdes	Meany Hall (UW)	February 26, 2013
2012	Music of Today: Newband, Featuring The Harry Partch Instrument Collection (concert)	Newband, Dean Drummond	Meany Hall (UW)	November 7, 2012
2012	Music of Today: New Digital Music by the Next Generation (concert)	Shih-Wei Lo, Hector Bravo-Benard, Marcin Pączkowski, Anthony Vine, Stelios Manousakis, Ivan Arteaga	Meany Hall (UW)	October 17, 2012
2012	DXARTS BFA Senior Thesis Exhibition	David Heflin, Vin Hill, Mary Kawamura, Matthew Lord Eva Malpaya, Chad McCurry Mario Nima, Josh Peterson, Ashley Prescott, Hannah Sayre, Gaelen Sayres, Evan Swope, Jonathan Torone, Andrew Theisen	DXARTS Fremont Fab Lab, Seattle	June 8-10, 2012
2012	Music of Today: JACK Quartet (concert)	Huck Hodge, Joël-François Durand, Juan Pampin, Richard Karpen	Floyd and Delores Jones Playhouse (UW)	May 18, 2012
2012	Improvised Music Project Festival IV: Vu-Karpen Project (concert)	Cuong Vu, Richard Karpen, Luke Bergman, Ted Poor	Glenn Hughes Penthouse Theatre (UW)	May 12, 2012
2012	Music of Today: An evening of 3D Digital Music (concert)	Oscar Pablo Di Liscia, Fernando Lopez-Lezcano, Juan Pampin	Meany Hall (UW)	April 25, 2012
2012	Music of Today: Vu-Karpen Project (concert)	Cuong Vu, Richard Karpen, Luke Bergman, Ted Poor	Meany Hall (UW)	February 14, 2012
2012	Embedding Absence: Works By DXARTS Phd Students (exhibition)	Robert Twomey, Meghan Trainor,	Jacob Lawrence Gallery (UW)	February 7-24, 2012

		Annabel Castro, and Ha Na Lee.		
2011	Music of Today: DXARTS Fall Concert	Daniel Peterson, Abby Aresty, Stelios Manousakis, Nicolás Varchausky, Juan Pampin	Meany Hall (UW)	November 9, 2011
2011	DXARTS BFA Senior Thesis Exhibition	Eddy Adams, Jesse Allen, Derek Edamura, Zachary Goist, Cody Groom, Devin Michael Johnson, Matthew Kaplan, Sunny Kim, Tracey West.	Jacob Lawrence Gallery (UW)	May 10-20, 2011
2011	Music of Today: A Celebration of John Chowning (concert)	John Chowning	Meany Hall (UW)	April 27, 2011
2011	Music of Today: Les Percussions de Strasbourg perform Grisey, Xenakis and Pampin (concert)	Les Percussions de Strasbourg	Meany Hall (UW)	February 19, 2011
2011	Music of Today: Idioms (concert)	Garth Knox, The Six Tones	Meany Hall (UW)	February 14, 2011
2011	Music of Today: Great Howl At Town Haul (concert)	Deep Listening Band	Town Hall, Seattle	January 15, 2011

Appendix H: UW Collaborators Map

The graph below shows a map of DXARTS collaborators within the UW. This includes faculty who have collaborated with our faculty in teaching and research projects, faculty who have given research support to our PhD students and have been members of their dissertation committees, as well as non-academic units with which we collaborate in different ways.



Appendix I: External Collaborators List

A list with DXARTS collaborators from outside of the UW can be found below. It includes artists and researchers who collaborate with our faculty, as well as institutions DXARTS collaborates with nationally and internationally.

Name/Institution	Location	DXARTS Collaborator(s)
Aktionsart	Seattle, WA	James Coupe
Anastasia Pistofidou, FabLab Bcn, IAAC,	Barcelona, Spain	Afroditi Psarra
Andreas Kiel, spherico.com	Karlsruhe, Germany	James Coupe
Ann Hamilton, Ohio State University	Columbus, OH	Juan Pampin
Apo-33	Nantes, France	Afroditi Psarra
Artist Trust	Seattle, WA	Juan Pampin
Astrid Keammerling, ICAS	San Francisco, CA	Afroditi Psarra
Bozar	Brussels, Belgium	Afroditi Psarra
Cecile Lapoire, CERN	Geneva, Switzerland	Afroditi Psarra
Ching-Wen Chao, National Taiwan Normal University	Taipei, Taiwan	Juan Pampin
Constanza Piña, Medialab MX	Mexico City, Mexico	Afroditi Psarra
Cuong Vu Trio, Trumpet, Bass, Drums	Seattle, WA, and New York City	Richard Karpen, Juan Pampin
Daphne Dragona, Transmediale	Berlin, Germany	Afroditi Psarra
Disney Research Zurich	Zurich, Switzerland	Afroditi Psarra
E-textile Summer Camp	Paillard, France	Afroditi Psarra
Elektronik	Rennes, France	Afroditi Psarra
Eli Shechtman, Weizmann Institute of Science	Rehovot, Israel	James Coupe
EMST	Athens, Greece	Afroditi Psarra
Etopia	Zaragoza, Spain	Afroditi Psarra
Eyeo Festival	Minneapolis, MN	Afroditi Psarra
FASE, Art, Science and Technology festival	Buenos Aires, Argentina	Juan Pampin
Fernando López-Lezcano, Stanford University	Palo Alto, CA	Juan Pampin
Garth Knox, Viola	Paris, France	Richard Karpen, Juan Pampin
Heinrich Taube, University of Illinois	Urbana Champaign, IL	Richard Karpen
IED	Madrid, Spain	Afroditi Psarra
Intermediae, Matadero	Madrid, Spain	Afroditi Psarra
Ioannis Zannos, Ionian University	Corfu, Greece	Afroditi Psarra
Jack Straw Cultural Center	Seattle, WA	DXARTS

JACK, String Quartet	New York City	Richard Karpen, Juan Pampin
Jaime Munnariz Ortiz, Complutense University of Madrid	Madrid, Spain	Afroditi Psarra
Jeff Surrak, ZeroMoon, Sonic Circuits festival	Washington D.C.	Afroditi Psarra
Jeong Han Kim, Seoul Women's University	Seoul, South Korea	Juan Pampin
John Robinson, University of York	York, UK	James Coupe
Jörgen Dahlqvist, Playwright/Director	Malmö, Sweden	Richard Karpen
Jouya Jadidian, apple.com	Cupertino, CA	Juan Pampin
Judith Sherman, Recording Producer	New York City	Richard Karpen
Kate Pullinger, Bath Spa University	Bath, UK	James Coupe
Kate Sicchio, NYU	New York City	Afroditi Psarra
Les Percussions de Strasbourg	Strasbourg, France	Juan Pampin
Liza Stark, Chloe Varelidi, LittleBits	New York City	Afroditi Psarra
Manuela Navaeu, Ars Electronica	Linz, Austria	Afroditi Psarra
Mariela Yeregui, Universidad Nacional de Tres de Febrero	Buenos Aires, Argentina	Juan Pampin
Matt Ingalls, Clarinets	Oakland, CA	Juan Pampin
MusicMakers Hacklab, CTM	Berlin, Germany	Afroditi Psarra
Neel Joshi, Microsoft Research	Redmond, WA	Juan Pampin, James Coupe
Onassis Cultural Center	Athens, Greece	Afroditi Psarra
Oscar Pablo Di Liscia, Universidad Nacional de Quilmes	Buenos Aires, Argentina	Juan Pampin
Pablo Fessel, Universidad de Buenos Aires	Buenos Aires, Argentina	Juan Pampin
Paul Aiello, Aiello Architects	Seattle, WA	James Coupe
percipo.com	San Francisco, CA	James Coupe
Piksel Festival	Bergen, Norway	Afroditi Psarra
Polyxeni Mantzou, Democritus University of Thrace	Thrace, Greece	Afroditi Psarra
Prodromos Tsiavos, National Documentation Center, ELLAK	Athens, Greece	Afroditi Psarra
Reid Swanson, UCSC	Santa Cruz, CA	James Coupe
Salon Bruit	Berlin, Germany	Afroditi Psarra
Schmiede festival, Subnet	Salzburg, Austria	Afroditi Psarra
Seattle Chamber Players	Seattle, WA	Juan Pampin
Seattle Symphony Orchestra	Seattle, WA	Richard Karpen
Shih Wei Chieh, MakerBar, Tribe Against Machine	Taipei, Taiwan	Afroditi Psarra
Shu Lea Chaeng, La Casa Encendida, Medialab-Prado	Madrid, Spain	Afroditi Psarra
Six Tones Trio, Traditional Vietnamese Instruments	Hanoi, Vietnam	Richard Karpen, Juan Pampin

Stattwerkstatt	Linz, Austria	Afroditi Psarra
Stefan Östersjö, Guitars	Malmö, Sweden	Richard Karpen, Juan Pampin
Steim	Amsterdam, Netherlands	Afroditi Psarra
Swedish Neuroscience Institute	Seattle, WA	Juan Pampin
Town Hall	Seattle, WA	DXARTS
Trafo	Bergen, Norway	Afroditi Psarra
Trond Lossius, BEK	Bergen, Norway	Juan Pampin
Videobrasil	Sao Paulo, Brazil	Afroditi Psarra
Winston Choi, Piano	Chicago, IL	Richard Karpen
Xenofon Bitsikas, University of Ioannina	Ioannina, Greece	Afroditi Psarra
Zoe Romano, WeMake, Arduino	Milan & Rome, Italy	Afroditi Psarra