

# W. JONG YOON, Ph.D.

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School of Science, Technology, Engineering & Mathematics  
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<https://www.uwb.edu/stem/undergraduate/majors/mechanical> (ME Program), <https://sites.uw.edu/wjyoon> (Research)

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## PROFESSIONAL EXPERIENCE

**Associate Professor,** September 2017 – present  
Mechanical Engineering, School of Science, Technology, Engineering & Mathematics  
**University of Washington, Bothell, WA**

- **Research Interests:** medical diagnostic devices; robot surgery; human computer interface; smart sensors and actuators; assistive/adaptive devices
- **Teaching Interests:** control systems, machine/mechanism design, mechatronics, statics/dynamics, vibrations, system dynamics, and medical device design.

**Assistant Professor,** September 2014 – 2017  
Mechanical Engineering, School of Science, Technology, Engineering & Mathematics  
**University of Washington, Bothell, WA**

**Assistant Professor,** September 2009 – June 2014  
Department of Mechanical & Industrial Engineering  
**Qatar University, Doha, Qatar**

**Research Assistant,** October 2002 – August 2009  
Human Photonics Lab & Human Interface Tech Lab  
**University of Washington, Seattle, WA**

- Developed an automated bladder urothelium surveillance system using a shape memory alloy-based programmable distal steering mechanism, an efficient motion sequence, 3-D image stitching, and an ultra-thin and flexible scanning fiber endoscope (SFE).
- Designed, numerically simulated, and fabricated a low-cost active tip-bending system using an ionic conductive polymer metal composites (IPMC) type electro active polymer (EAP) actuator.
- Conducted a parametric study on the role of haptic and visual sensory information in the perception of curved objects using a low-cost haptic interfaces device.

**Research/Manufacturing Engineer,** Information & Optical Device Division, July 1997 - April 2001  
**Samsung Electro-Mechanics, Suwon, Korea (south)**

- **R&D center.** Designed high speed miniature motors and gear systems used for cellular phone auto-folding system (November 2000 ~ April 2001).
- **Manufacturing Technology group.** Developed and implemented manufacturing process for 2.5” Hard Disk Drive (HDD) spindle motors used for TOSHIBA laptops. (May 1998 ~ November 2000).
- **Information Technology Group R&D laboratory.** Designed 3.5”/3.0” HDD/Zip Drive spindle motors (July 1997 ~ May 1998).

**Executive Officer** (First Lieutenant), Field Artillery, March 1995 - June 1997  
**Army of the Rep. of Korea**

- Took command responsibilities for 90 soldiers (private first/second class and corporals).

## EDUCATION

- Ph.D., Mechanical Engineering,** August 2009  
**University of Washington,** Seattle, WA  
Dissertation: Development of an automated bladder urothelium surveillance system using an ultra-thin image probe and active distal steering  
Advisor: Eric J. Seibel
- Master of Science, Mechanical Engineering,** September 2004  
**University of Washington,** Seattle, WA  
Thesis: New design and modeling of a bending mechanism of the single fiber endoscope  
Advisor: Eric J. Seibel
- Bachelor of Engineering, Mechanical Engineering,** March 1995  
**Hong Ik University,** Seoul, Korea (south)

## SPONSORED RESEARCH/GRANTS

### Funded

- **PI, Department of Labor & Industries Safety & Health Investment Projects (SHIP) Grant** (Project ID: 2022YH00471, Contract Number: K-5268), A Comparative Study of Different Wheelchair-toilet Transfer Approaches to Reduce Caregiver’s Work-Related Musculoskeletal Disorders, Co-PI: Sang-Geun Ahn, UW Seattle, Subcontract: Oregon State University, Co-PI: Dr. Jay Kim, Partner: LeadingAge Washington (CEO: Deb Murphy), \$174,689. 2023-2025
- **Co-PI, Department of Neurological Surgery,** Preemptive personalized medicine for spinal-column lesions, PI - Anu Amin MD Department of Neurological Surgery, UW Seattle & Jong Yoon PhD Division of Engineering and Mathematics, UW Bothell, \$5,700 2023
- The Connected Learning Course funds, Hannam Design Factory micro-design challenge, \$500 2023
- **Advisor, SPEEA-IFPTE, 2021 STEM grant,** Trickfire Robotics-NASA competition, \$1,125 2021
- **PI, UW Bothell Scholarship, Research, and Creative Practice (SRCP) Grant,** Gizmo 2.0 – a cross-disciplinary robot for enhancing recovery after stroke-induced hemispatial neglect, Co-Is: Jody Early, Nina Lapiana, Pierre D. Mourad, Erika Parsons, Consultants: Aaron Bunnell, Andrea Stocco, \$28,593 2021-2022
- **Advisor,** Prototype Fund recipient, Hollomon Health Innovation Challenge, Team Apex Design Haus, “Endoscopic User-Interface” project, \$ 2,100 2019-2020
- **PI, UW NSF I-Corps Site Grants,** Roll-over-toilet, \$2,500 2019-2020
- Makespace Learning Community Professional development and Travel support grant, \$500 2019
- **PI, Amazon Catalyst grant,** 2017-2018  
“Modular kit development for the safe and easy use of public restrooms for wheelchair Patients”, \$35,000
- **Advisor,** ASME (Hackathon Project), STF Grant, UW Bothell, \$20,000 2017
- **Advisor,** TrickFire Robotics, Student Technology Fee, UW Bothell, \$10,000 2016
- **Advisor,** Prototype Fund recipient, UW Health Innovation Challenge, \$ 800 2015 December
- **Co-Lead PI, the National Priorities Research Program (NPRP),** Qatar Foundation, 2013-2016  
“Blindness in Eastern Arabia: An Engineering Solution” NPRP 5-457-2-181, \$ 1,039,176
- **Student Project Grant,** Qatar University 2012-2013  
“Design of Development of Solar Arrays Deployment Mechanism for Microsatellite”, QUST-CENG-FALL-12/13-16, QR 8,500
- **ABB Technology and Qatar University Student Projects on Robotics, ABB co.** 2011-2012

- **Lead PI, the National Priorities Research Program (NPRP)**, Qatar Foundation 2012-2016  
“Integrated Bio-Sensors and Automated Instrumentation for Early Stomach Cancer Detection Using Flexible Capsule Endoscope”, NPRP 4-049-2-021, US \$1,035,523.
- **Co-Lead PI, the National Priorities Research Program (NPRP)**, Qatar Foundation 2012-2016  
“Development of Smart Minimum Invasive Surgery Tools with Tactile Sensing Capabilities for Telerobot Surgery System”, NPRP 4-368-2-135, US \$1,018,554
- **Student Project Grant**, Qatar University  
2011-2012 “Design and Development of an Arabic Speech-Controlled Multifunction Toilet-friendly Wheelchair “, QUST-ENG-MIE-10/11-21, QR 32,400
- **Undergraduate Research Experience Program (UREP)**, Qatar Foundation, 2010-2011  
“Parametric Study of Virtual Curvature Recognition: Discrimination Thresholds for Haptic and Visual Sensory Information” UREP 08-014-2-006, US \$30,000
- **Lead PI, the National Priorities Research Program (NPRP)**, Qatar Foundation 2010-2013  
“Development and Test of a Surgical Telerobot System Integrated with a Flexible Imaging Probe in Hostile Environments”, NPRP09-776-2-298, US \$859,027.
- **Lead PI, the National Priorities Research Program (NPRP)**, Qatar Foundation 2010-2013  
“Development of an Automated Urinary Bladder Surveillance System for Cancer Diagnosis”, NPRP09-214-2-090, US \$982,941
- **Start Up Fund**, Qatar University, QR 50,000 October 2009
- Recipient of the **Technology Gap Innovation Fund (TGIF) awards (Co-PI)** June 2008 – 2009  
**Washington Research Foundation/Royalty Research Fund**, USA, \$47,477

#### Submitted or In-preparation (30)

- **UW Bothell Midcareer Faculty Fellowship** (submitted on 1/21/2024)
- **PI, UW Bothell Scholarship, Research, and Creative Practice (SRCP) Grant** (submitted on 12/15/2023), Development of a Collaborative Robot-Assisted Ultrasound System for CPR, Co-I: Ji-Eun Kim (UW Seattle), Consultant: Pierre D. Mourad (UW Bothell) (requested budget: \$28,504)
- **Co-PI**, The AO Spine NA Young Investigator Research Grant Award (will be submitted on 1/1/2024), PI – Anubhav G Amin (requested budget: \$20,000)

## HONORS & AWARDS

- **Finalist, Club Advisor of the Year**, Student Engagement & Activities Club Council, University of Washington Bothell, 2021/2022
- **Amazon Catalyst Fellow**, <https://catalyst.amazon.com/uw/projects/> 2017-2018
- **Advisor, The UW Health Innovation Challenge**, 2016, Measurement and Verification of CO2 gas sensor for Helico pylori infection, **Finalist**
- **Feature Article, TMBE**, Hieu T. Nguyen, Siva M. Tangutooru, Corey M. Rountree, Andrew J. Kantzos, Faris Tarlochan, *W. Jong Yoon* and John B. Troy, Thalamic visual prosthesis, *IEEE/ASME Transactions on Biomedical Engineering*, 2016, Vol. 63, No. 8, pp. 1573-1580, August 2016
- **Best Student Paper Award – Finalist**, July 15-17, 2015  
7th IEEE International Conference on Cybernetics and Intelligent Systems (CIS) and the 7th IEEE International Conference on Robotics, Automation and Mechatronics (RAM), Angkor Wat, Cambodia, “Design of a Steering Mechanism for a Tethered Capsule Endoscope”
- **Outstanding Paper Award**, April 28, 2009  
The Engineering & Urology Society 24<sup>th</sup> Annual Meeting, Chicago, IL, “In Vitro Test of an Automated Cystoscopic Procedure for Bladder Surveillance”
- **2nd Best Student Paper**, June 7 - 8, 2007  
ASME Frontiers in Biomedical Devices Conference, Irvine, CA, “Steerable Guidewire with Eyes for Image guided Intervention in the Upper Urinary Tract”

- Recipient of **KUSCO (Korea-U.S. Science Cooperation) Scholarship**, February 2007
- **Certified Six Sigma qualification as Green Belt**, Samsung Electro-Mechanics. Carried out two Six Sigma projects related to HDD spindle motor resonance and productivity. Ranked in top 5%, 2000
- Recipient of **college scholarship**, Hong Ik Univ., Korea, March 1991 - February 1993
- Recipient of **National Scholastic Ability Test Fellowship**, Hong Ik Univ., Korea, March 1991

## PUBLICATIONS

### Peer-Reviewed Journals/Books

1. John-John Cabibihan, Ahmad Yaser Alhaddad, Tauseef Gulrez, and W. Jong Yoon, Influence of Visual and Haptic Feedback on the Detection of Threshold Forces in a Surgical Grasping Task, *IEEE Robotics and Automation Letters*, RA-L. Print ISSN: 2377-3766 Online ISSN: 2377-3766 DOI: 10.1109/LRA.2021.3068934, March 2021 (<https://ieeexplore.ieee.org/document/9387070>)
2. Carlos Velasquez, Yoon Sang Kim, Thomas Lendvay, Blake Hannaford, W. Jong Yoon, RAVEN Eyes Around the Instrument from Modular Axis Sharing, *International Journal of Control, Automation and Systems*, 1-11, 2018. <https://doi.org/10.1007/s12555-017-0228-6>
3. Ko, J., Yoon, W.J. & Kim, Y.S. A study on surgical robot image stabilization. *Multimed Tools Appl* 77, 9871–9883 (2018). <https://doi.org/10.1007/s11042-017-5330-5>
4. Kishor kumar Sadasivuni, Ahmad Yaser Alhaddad, H. Javed, W. Jong Yoon, and John-John Cabibihan, Strain, Pressure, Temperature, Proximity, and Tactile Sensors From Biopolymer Composites, *Biopolymer Composites in Electronics*, Elsevier, pp.437-457, 2017, (DOI: 10.1016/B978-0-12-809261-3.00016-4)
5. Hieu T. Nguyen, Siva M. Tangutooru, Corey M. Rountree, Andrew J. Kantzos, Faris Tarlochan, W. Jong Yoon and John B. Troy, Thalamic visual prosthesis, *IEEE/ASME Transactions on Biomedical Engineering*, 2016, Vol. 63, No. 8, pp. 1573-1580 (**Feature Article, TMBE August 2016**)
6. Deepalekshmi Ponnamma, Kishor Kumar Sadasivuni, John-John Cabibihan, W. Jong Yoon, Bijandra Kumar, Reduced Graphene Oxide Filled Poly(dimethyl siloxane) based Transparent Stretchable, and Touch-Responsive Sensors, *Applied Physics Letters*, 2016, Vol. 108, Issue 17, pp. 171906
7. Y. Chen; Y. Zilberman; S. K. Ameri; W. J. Yoon; J. J. Cabibihan; S. Sonkusale, "A flexible gastric gas sensor based on functionalized optical fiber," *IEEE Sensors Journal*, vol. 16, issue 13, pp.5243-5248, (doi: 10.1109/JSEN.2016.2544701), 2016
8. Tauseef Gulrez, A. Tognetti, W. Jong Yoon, and John-John Cabibihan, A Hands-Free Interface for Controlling Virtual Electric-Powered Wheelchair, *International Journal of Advanced Robotic Systems (IJARS)*, 2016, 13:49 doi:10.5772/62028.
9. Dong-Hyuk Lee, Uikyum Kim, Tauseef Gulrez, W. Jong Yoon, Blake Hannaford, and Hyouk Ryeol Choi, A Laparoscopic Grasping Tool with Force Sensing Capability, *IEEE/ASME Transactions on Mechatronics*, vol. 21, no. 1, pp. 130-141, Feb. 2016. (doi: 10.1109/TMECH.2015.2442591)
10. Xianming Ye, Yuanzheng Gong, W. Jong Yoon, Development of Multi-segment Steering Mechanism and 3D Panorama for Automated Bladder Surveillance System, *IEEE/ASME Transactions on Mechatronics*, Vol. 21, No. 2, pp. 993-1003, 2016, (DOI: 10.1109/TMECH.2015.2461596)
11. Carlos Velasquez, Nikhil V. Navkar, Amer Alsaied, Shidin Balakrishnan, Julien Abinahed, Abdullah Al-Ansari, and W. Jong Yoon, Preliminary Design of an Actuated Imaging Probe for Generation of Additional Visual Cues in a Robotic Surgery, *Surgical Endoscopy*, 30(6):2641-2648, 2016 (DOI: 10.1007/s00464-015-4270-2)
12. W. Jong Yoon, Wook-Yeon Hwang, Joel C. Perry, Study on Effects of Surface Properties in Haptic Perception of Virtual Curvature, *International Journal of Computer Applications in Technology*, 2016, Vol 53, No. 3, pp.236-243.

13. Uikyum Kim, Dong-Hyuk Lee, W. Jong Yoon, Blake Hannaford, and Hyouk Ryeol Choi, Force Sensor Integrated Surgical Forceps for Minimally Invasive Robotic Surgery, *IEEE Transactions on Robotics*, 2015, 31 (5), 1214-1224, (DOI: 10.1109/TRO.2015.2473515)
14. W. Jong Yoon, Carlos A. Velasquez, Lee W. White, Blake Hannaford, Yoon Sang Kim, and Tomas Lendvay, Preliminary articulable probe designs with RAVEN and challenges: Image guided robotic surgery multi-tool system, *ASME Journal of Medical Devices*, 2013; 8(1):014505-014505-6. MED-13-1122 (DOI: 10.1115/1.4025908)
15. M. Burkhardt, T. Soper, W. Jong Yoon, and E. J. Seibel, Controlling the Trajectory of a Flexible Ultrathin Endoscope for Fully Automated Bladder Surveillance, *IEEE/ASME Transactions on Mechatronics*, 2014, Vol. 19, No. 1, pp. 366-373 (DOI:10.1109/TMECH.2013.2237783)
16. W. Jong Yoon, Matthew A. Brown, Per. G. Reinhall, Sangtae Park, and Eric J. Seibel, Design and Preliminary Study of Custom Laser Scanning Cystoscope for Automated Bladder Surveillance, *Minimally Invasive Therapy and Allied Technologies (MITAT)*, September 2012, Vol. 21, No. 5, pp. 320-328 (DOI:10.3109/13645706.2011.653374)
17. W. Jong Yoon, Sangtae Park, Per G. Reinhall, and Eric J. Seibel, Development of an automated steering mechanism for bladder urothelium surveillance, *ASME Journal of Medical Devices*, 2009; 3(1):011004-011004-9. (DOI: 10.1115/1.3054381)
18. W. Jong Yoon, Per G. Reinhall, and Eric J. Seibel, Analysis of Electro Active Polymer Bending: A Component in a Low-Cost Ultrathin Scanning Endoscope, *Sensors and Actuators A –Physical*, Volume 133, Issue 2, 12 February 2007, pp. 506-517. (DOI: 10.1016/j.sna.2006.04.037)

#### Peer-Reviewed Journals/books in preparation & submitted.

1. Hyoji Choi, Yeonbae Kim, Woon Jong Yoon (submitted to the Journal of Technology Transfer in April 2022, EMID:9647e6e93d736664), The effects of regional knowledge spillovers on firm innovation in different technological regimes: A multilevel study.
2. W. Jong Yoon (submitted to The Engineering Design Graphics Journal, manuscript ID: 755, in October 2023), Investigating the Impact of an Engineering-based Junior-level Computer Aided Design (CAD) course in Engineering Education.
3. Aaron Bunnell, Madison Dienhart, Jody Early, Paul Hage, Olha Kuriatnyk\*, Pierre D. Mourad, Olivia A. Oomen\*, Erika Parsons, Haley Read\*, W. Jong Yoon (in prep, JMIR Rehabilitation and Assistive Technologies), A small robot for enhancing upper motor stroke therapy.

#### Peer-Reviewed Conference Proceedings

1. W. Jong Yoon, Development of gamifying robots for improving stroke recovery and cross-disciplinary undergraduate research experience, KSEA US Korea Conference (UKC) 2023, August 2 – 5, 2023, Dallas, TX
2. W. Jong Yoon, Maria Barrios\*, Eric Mendoza\*, Pierre Mourad, Design and Optimization of a Collaborative Robot-Assisted Ultrasound Imaging for Automated Vascular Diagnosis, 20th International Conference on Ubiquitous Robots (UR), June 25-28, 2023, Honolulu, HI.
3. Nicholas deGrasse\*, W. Jong Yoon, A foldable Wheelchair Seat for Easier Restroom Access, RESNA 2021 Annual conference, February 12, 2021, Virtual.  
[https://www.resna.org/sites/default/files/conference/2021/SeatingandMobility/66\\_deGrasse.html](https://www.resna.org/sites/default/files/conference/2021/SeatingandMobility/66_deGrasse.html)
4. Hyoji Choi, Yeonbae Kim, W. Jong Yoon, 지역 산업 집적 양상과 협력의 결정 및 성과에 관한 연구, Korean Society for Innovation Management and Economics (of KOSIME) Winter 2019 Academic Conference, Feb 15, 2019, Pukyong National University, Korea
5. W. Jong Yoon, Mohamed Shakir, Yasir Salih Osman, Design and Development of a Smart Multifunction Toilet Wheelchair (SMTW), 15th International Conference on Ubiquitous Robots (UR), June 27-30, 2018, Hawaii Convention Center, Hawaii, USA.
6. Xianming Ye, John-John Cabibihan, W. Jong Yoon, Design and Verification of a Flexible Device for Steering a Tethered Capsule Endoscope in the Stomach, the 14<sup>th</sup> International Conference on Ubiquitous Robots and Ambient Intelligence, June 28 – July 1, 2017, Jeju, Korea.

7. W. Jong Yoon, CAD vs. Modeling, Design, and Analysis?, ASEE Pacific Northwest Section Conference 2016, Boise, Idaho, April 1, 2016.
8. Kishor Kumar Sadasivuni, W. Jong Yoon and John-John Cabibihan, Cellulose nanocrystals (biomaterial) based touch sensors for biomedical applications, IEEE Life Sciences Grand Challenges Conference (LSGCC), 25-26 January 2016, Abu Dhabi, UAE.
9. Xianming Ye, Cyril Hasson, W. Jong Yoon, John-John Cabibihan, Design of a Steering Mechanism for a Tethered Capsule Endoscope, 7<sup>th</sup> IEEE International Conference on Cybernetics and Intelligent Systems (CIS) and the 7<sup>th</sup> IEEE International Conference on Robotics, Automation and Mechatronics (RAM), 15-17 July 2015, Angkor Wat, Cambodia, **Best Student Paper Award – Finalist**.
10. Siva M. Tangutooru, W. Jong Yoon, and John B. Troy, Early Design Considerations for a Thalamic Visual Prosthesis to Treat Blindness Resulting from Glaucoma, Middle East Conference on Biomedical Engineering (MECBME'14), February 17-20, 2014, Doha, Qatar.
11. Dong-Hyuk Lee, Ui-Kyum Kim, Hyungpil Moon, Jachoon Koo, Woon Jong Yoon, and Hyouk Ryeol Choi, Preliminary Design of Multi-Axial Contact Force Sensor for Minimally Invasive Robotic Surgery Grasper, 2013 IEEE International Conference on Robotics and Automation (ICRA) (39% acceptance rate), May 6-10, 2013, Karlsruhe, Germany, pp. 1019 – 1024, DOI: 10.1109/ICRA.2013.6630698
12. Junho Ko, Woon Jong Yoon, and Yoon Sang Kim, Image Stabilization of Tele-surgical Robot based on Image Sensor, Advanced Science and Technology Letters, Vol.30 (ICCA 2013), pp.74-77, <http://dx.doi.org/10.14257/astl.2013.30.15>
13. Xianming Ye and W. Jong Yoon, Preliminary Design of a Bending Mechanism for Automated Cystoscope, The 8<sup>th</sup> IEEE International Conference on Automation Science and Engineering (CASE 2012), August 20-24, 2012, Seoul, Korea, pp. 261-266, DOI: 10.1109/CoASE.2012.6386429
14. Carlos A. Velasquez, H. Hawkeye King, Blake Hannaford and W. Jong Yoon, Development of a Flexible Imaging Probe integrated to a Surgical Telerobot System: Preliminary Remote Control Test and Probe Design, Fourth IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics, June 2012, Rome, Italy, pp. 894-898, DOI: 10.1109/BioRob.2012.6290880
15. Eric J. Seibel, Timothy D. Soper, Matthew R. Burkhardt, Michael P. Porter, W. Jong Yoon, Multimodal flexible cystoscopy for creating co-registered panoramas of the bladder urothelium, Photonic Therapeutics and Diagnostics VIII, edited by Nikiforos Kollias, et al., *Proc. Of SPIE* Vol. 8207, 82071A (2012); presented on 21 – 26, January 2012 Moscone Center, San Francisco, CA, USA, DOI: 10.1117/12.909035
16. Carlos A Velasquez, Xianming Ye and, and W. Jong Yoon. Design of a Flexible Imaging Probe for Robotics Surgery. Qatar Foundation Annual Research Forum Proceedings: Vol. 2011, BMP9. DOI: 10.5339/qfarf.2011.bmp9
17. Xianming Ye, Carlos Velasquez and, and W. Jong Yoon. Design of Steering Mechanism for Automated Cystoscopy. Qatar Foundation Annual Research Forum Proceedings: Vol. 2011, BMP3. DOI: 10.5339/qfarf.2011.bmp3
18. W. Jong Yoon, Tim Soper, and Eric J. Seibel, Automated 3D Mosaicing and Scan Trajectories for Surveillance of Bladder Cancer, Proceedings of the 2011 Design of Medical Devices Conference, DMD2011-5289, April 12-14, 2011, Minneapolis, MN, USA.
19. W. Jong Yoon, Joel C. Perry, Blake Hannaford, Parametric Study of Virtual Curvature Recognition: Discrimination Thresholds for Haptic and Visual Sensory Information, The fifth International Workshop on Haptic and Audio Interaction Design (HAID), LNCS 6306, pp. 26–36, Copenhagen, Denmark, September 16-17, 2010.
20. W. Jong Yoon, Matthew A. Brown, Eric J. Seibel, Automated Cystoscopic Surveillance System with Endoscopic Image Mosaicing, *The 12<sup>th</sup> Mechatronics Forum Biennial International Conference*, Swiss Federal Institute of Technology, ETH Zurich, Switzerland, June 28-30, 2010, book ½, pp. 86-90.

21. W. Jong Yoon, Sangtae Park, Per G. Reinhall, and Eric J. Seibel, In Vitro Test of an Automated Cystoscopic Procedure for Bladder Surveillance, *The Engineering & Urology Society 24<sup>th</sup> Annual Meeting*, Chicago, IL, April 25<sup>th</sup>, 2009. **Ranked Top 10** among the 127 submitted to the E&U meeting.
22. W. Jong Yoon, Sangtae Park, Per G. Reinhall, and Eric J. Seibel, Automated Bladder Surveillance System Using an Ultrathin Laser Imaging Probe and Active Distal Steering, *The Engineering & Urology Society 23<sup>rd</sup> Annual Meeting*, Orlando, FL, May 17<sup>th</sup>, 2008. *Journal of Endourology*, 22(11), November 2008, pp. 2595
23. W. Jong Yoon, Per G. Reinhall, and Eric J. Seibel, Steerable Guidewire with Eyes for Image-guided Intervention in the Upper Urinary Tract, *Proceedings of ASME 2<sup>nd</sup> Frontiers in Biomedical Devices Conference, BioMed 2007-38059*, Irvine, CA, June 7-8, 2007, pp.57-58.

## ABSTRACTS/POSTERS AND TALKS

1. W. Jong Yoon, UW Bothell-GNU International Research Exchange Meeting for Advanced Materials, August 8, 2023.
2. W. Jong Yoon, Husky Highlights Seminar Series, Gizmo 2.0 – a cross-disciplinary robot for enhancing recovery after stroke-induced hemispatial neglect, Tuesday, February 7, 2023.
3. Asim Burak\* and W. Jong Yoon, Human perception of Force through friction in a virtual environment, UWB-GNU International Research Exchange Workshop, December 15, 2022
4. Maria Barrios\*, Eric Mendoza\*, Pierre Mourad, W. Jong Yoon, Design and Optimization of a Collaborative Robot with a Portable Ultrasound Machine for Brachial Vein Imaging, Annual Biomedical Research Conference for Minority Students (ABRCMS, Control Number 22-P-1047-ABRCMS), Anaheim, CA, Nov. 9-12, 2022
5. Young Beum Cho\*, W. Jong Yoon, Mini-model Study of Optimal Speed Control Power Wheelchair for Down slop Assistive Driving, KSEA YGNITE, January 11, 2020
6. W. Jong Yoon, Unmet clinical needs and smart medical devices - from the standpoint of mechanical engineering students, Invited seminar, Department of Mechanical and Materials Engineering at Portland State University, October 19, 2018
7. W. Jong Yoon, Danny Robinson\*, Vincent Valdez\*, Perapat Tantawarak\*, Smart Wheelchair, UWB Undergraduate Research and Creative Practice Symposium, May 12, 2017 (poster and oral presentation)
8. W. Jong Yoon, Embedded systems, IOT Devices and Electronics Pre-Hackathon, UWB Makerspace, March 31, 2017
9. W. Jong Yoon, 11<sup>th</sup> Northwest Regional Conference, October 29-30, 2016, San Jose, CA
10. Xianming Ye, W. Jong Yoon, John-John Cabibihan, Design of a Flexible Soft Tether for Omnidirectional Camera Manipulation within the Stomach, US-Korean Conference (UKC 2016) on Science, Technology, and Entrepreneurship, August 10-13, 2016, Dallas, TX
11. Xianming Ye, W. Jong Yoon, John-John Cabibihan, Flexible Tethered Capsule Steering for Stomach Screening, IEEE Life Sciences Grand Challenges Conference (LSGCC), 25-26 January 2016, Abu Dhabi, UAE
12. W. Jong Yoon, How to apply creativity and innovation toward currently unmet clinical needs, *Research In Progress*, Spring 2015, B CUSP 290
13. Yu Chen, Shideh Kabiri, W. Jong Yoon, John-John Cabibihan and Sameer Sonkusale, Functionalized optical fiber sensor platform for detection of gastric ammonia and carbon dioxide for early screening of stomach disease, *2<sup>nd</sup> International Conference on Label-Free Technologies*, 12-14 March 2015, Boston Marriott Cambridge, MA, USA
14. Ayub Mohammed, Mohammad Hassan Mohammad Khorasani, Nikhil V. Navkar, Carlos A. Velasquez, W. Jong Yoon, Julien A. Abi-Nahed, Abdullah Al Ansari, Preliminary Design of an Actuated Probe for Enhance Visualization in Robotic Surgeries, *Qatar Foundation Annual Research Forum 2014*, Doha, Qatar

15. SM Tangutooru, W. J. Yoon, JB Troy – Theoretical characterization of current and voltage distribution in lateral geniculate nucleus of thalamus using deep brain stimulation, *Neuromodulation*, 17(5):e79, 2014
16. Xianming Ye, Yuanzheng Gong, and W. Jong Yoon, In Vitro Results Of Robotic Cystoscope And 3d Panorama For Automated Bladder Surveillance System (ABSS), *The Engineering & Urology Society*, 29<sup>th</sup> Annual meeting, May 17, 2014, Hyatt Regency, Orlando, FL, USA, **Top 10 Abstracts Award.**
17. Cyril Hasson, W. Jong Yoon, Navigation capabilities for a flexible tethered capsule endoscope, *Qatar Foundation Annual Research Forum* 2013, Doha, Qatar
18. Siva M. Tangutooru, W. Jong Yoon, and John B. Troy, Preliminary Studies for a Thalamic Visual Prosthesis to Treat Blindness Resulting from Glaucoma, *Qatar Foundation Annual Research Forum* 2013, Doha, Qatar
19. Xianming Ye, W. Jong Yoon; Design of An Automated Cystoscope For Bladder Cancer Surveillance, *The Engineering & Urology Society*, May 19, 2012, Georgia World Congress Center, Atlanta, GA, **Top 10 Abstracts Award.**
20. **Invited Speaker**, “Evolution: From No Intelligence to Autonomous and Smarter Biomedical Diagnostic and Assistive Devices” Workshop, *Robotics and Intelligent Control*, AI-2012 Thirty-second SGAI International Conference on Artificial Intelligence, Cambridge, UK, 11-13 December 2012
21. Invited talk, “Hang in there tough, and keep believing in your dream.”: Bio-Medical engineering?”, Department of Mechanical and System Design Engineering, Hong Ik University, Seoul, Korea, September 5<sup>th</sup>, 2011.
22. Poster Presentation, “Discrimination Thresholds of Virtual Curvature for Haptic and Visual Sensory Information and Future Applications in Medical Virtual Training”, Qatar Foundation Annual Research Forum 2010, Doha, Qatar, December 12-13<sup>th</sup>, 2010.
23. Invited talk, “Qatar, Qatar University and Smart Medical Devices Lab.”, College of Engineering, Konkuk University, Seoul, Korea, July 14<sup>th</sup>, 2010.
24. QU Research Forum-2010, Session 6, Health 2, *In Vitro* Test of An Automated Cystoscopic Procedure for Bladder Surveillance, May 5, 2010.
25. Invited talk, “Development of an Automated Bladder Urothelium Surveillance System”, Korean World Urologic Congress, American Urology Association (AUA) annual meeting, Hyatt Regency McCormick Place, Chicago, IL, April 26, 2009.
26. Invited talk, “Mechanical Engineering in the Computer Components and Medical Device Industries in Korea, Japan, and the U.S.”, Department of Mechanical and System Design Engineering, Hong Ik University, Seoul, Korea, December 9<sup>th</sup>, 2008.
27. Conference presentation, “Active Steering Mechanism for Bladder Tumor Surveillance”, The 3<sup>rd</sup> KSEA Northwest Regional Conference, University of Phoenix, Sacramento, CA, Nov 1<sup>st</sup>, 2008.
28. Invited talk, “Efficient Automated Bladder Urothelium Imaging”, Young Generation Professional Forum, KSEA Pacific Northwest Chapter, Hilton Hotel, Bellevue, WA, March 1<sup>st</sup>, 2008.
29. Conference presentation, “Steerable Ultrathin Scanning Endoscope Development for Image-guided Interventions”, The 17<sup>th</sup> Annual KSEA South-Western Regional Technology Conference, Hilton Pasadena, CA, February 10<sup>th</sup>, 2007
30. Poster, “Current Development of Scanning Fiber Endoscope and Steering Mechanism for Upper Urinary Applications”, the Visiting Committee and Advisory Board Day, University of Washington, February 9<sup>th</sup>, 2007.

## PATENTS/ INVENTION DISCLOSURES

### Patents

1. W. Jong Yoon, Sang-gyeun Ahn, "Multifunction Toilet Wheelchair", USPTO, Patent No.: US 11,793,695B2, filed 6/24/2020, issued 10/24/2023, UW Reference: 47453.03US2 (based on the following two provisional patents)



- W. Jong Yoon, Sang-gyeun Ahn, Apparatus for folding wheelchair conversion to adjustable height commode, U.S. Provisional Patent Filing, Application # 62/876,317, UW Ref.No. 48159.01US1, 7/19/2019.
  - W. Jong Yoon, Smart Multifunction Toilet Wheelchair, U.S. Provisional Patent Filing, Application # 62866390, UW Ref.No. 47453.01US1, 6/25/2019.
2. Tauseef Gulrez, W. Jong Yoon, Cutaneous Haptic Feedback System and Methods of Use. USPTO, issued as U.S Patent No. US9946350B2 on April 17, 2018.
  3. W. Jong Yoon, Eric Seibel, Matthew (Matt) Burkhardt, Timothy Soper, Image-Based Feedback Endoscopy System, USPTO, issued as U.S Patent No. US10130243B2 on November 20, 2018.
  4. W. Jong Yoon, Eric J. Seibel, Per G. Reinhall, Rob Sweet, Efficient Automated Urothelial Imaging Using an Endoscope with Tip Bending, U.S. Patent application number, #12/033,826, Filed: Feb. 19, 2008.

#### Invention Disclosures

1. W. Jong Yoon, Modular kit development for the safe and easy use of public restrooms for wheelchair Patients, Record of Innovation (ROI) Reference Number: 4082 (September 7, 2017), University of Washington
2. W. Jong Yoon, Smart Multifunction Toilet Wheelchair, Record of Innovation (ROI) Reference Number: 3312 (September 2, 2015), University of Washington
3. W. Jong Yoon, E. J. Seibel, P. G. Reinhall, R. Sweet, Efficient Automated Bladder Urothelium Imaging with an Optimum Trajectory of the Scanning Fiber Endoscope and Mosaic Algorithm: Scanning the Scanner, Record of Invention-file #7771D, 2007, University of Washington
4. W. Jong Yoon, E. J. Seibel, B. Otis, Design of Multi-Segmented Shape Memory Alloy Actuators for Navigation of Ultrathin Flexible Endoscopes, Record of Invention-file #7519D, 2006, University of Washington
5. E. J. Seibel, W. Jong Yoon, Active Tip Bending and shaft Control of Ultrathin Flexible CatheterScopes, Record of Invention-file # 7132D, 2004, University of Washington

### TEACHING EXPERIENCE

<b>Introductory Seminar for Mechanical Engineering (B ME 301)</b>	Instructor, University of Washington, Bothell
Reviews the mechanical engineering degree program at UW Bothell, emphasizing its unique features as well as relating its structure and intent to mechanical engineering as a profession. Credit/no-credit only.	
Winter 2022	Evaluation: 3.9/5.0 (No. of students: 50)
Winter 2023	Evaluation: 3.7/5.0 (No. of students: 58)
Winter 2024	Evaluation: on-going/5.0 (No. of students: 31 )

<b>Introduction to Mechatronics (B ME 460)</b>	Instructor, University of Washington, Bothell
Introduction of Mechatronics; Review of basic programming language; Analog and digital circuit fundamentals; Microcomputer architecture and applications; Fundamentals of electro-mechanical actuators/sensors; Smart materials and application to intelligent systems.	
Spring 2016	Evaluation: 4.1/5.0 (No. of students: 22)
Spring 2017	Evaluation: 3.9/5.0 (No. of students: 14)
Winter 2018	Evaluation: 4.8/5.0 (No. of students: 24)
Winter 2019	Evaluation: 4.6/5.0 (No. of students: 23)
Spring 2019	Evaluation: 4.2/5.0 (No. of students: 13)
Winter 2020 (half online)	Evaluation: 4.3/5.0 (No. of students: 24)

Spring 2021 (Hybrid) - Overload	Evaluation: 4.8/5.0 (No. of students: 18)
Winter 2022 (Hybrid) - Overload	Evaluation: 4.7/5.0 (No. of students: 24)
Winter 2023	Evaluation: 4.5/5.0 (No. of students: 20)
Winter 2024	Evaluation: on-going/5.0 (No. of students: 21)

<b>Statics (B ME 221)</b>	Instructor, University of Washington, Bothell
Applies vector analysis to equilibrium of rigid body systems and subsystems. Includes force and moment resultants, free body diagrams, internal forces, and friction. Analyzes basic structural and machine systems and components.	
Winter 2015	Evaluation: 4.7/5.0 (No. of students: 7)

<b>Dynamics (B ME 223)</b>	Instructor, University of Washington, Bothell
Kinematics of particles, systems of particles, and rigid bodies; moving reference frames; equilibrium, energy, linear momentum, angular momentum. Includes laboratory.	
Spring 2015	Evaluation: 4.9/5.0 (No. of students: 15)
Spring 2016	Evaluation: 3.9/5.0 (No. of students: 34)
Summer 2019	Evaluation: 3.7/5.0 (No. of students: 10)
Summer 2020 (online)	Evaluation: 4.8/5.0 (No. of students: 4)
Spring 2021 (online)	Evaluation: 3.2/5.0 (No. of students: 31)
Spring 2022	Evaluation: 4.6/5.0 (No. of students: 33)

<b>Intro to 3D Modeling, Design, and Analysis (B ME 315)</b>	Instructor, University of Washington, Bothell
Design, representation, and analysis of three-dimensional objects using computational methods and computer-aided design (CAD). Topics include free hand sketching, optimization of design parameters, documentation and communication of design information using appropriate engineering standards and practices.	
Winter 2015	Evaluation: 2.9/5.0 (No. of students: 24)
Summer 2015	Evaluation: 4.0/5.0 (No. of students: 8)
Fall 2015	Evaluation: 4.0/5.0 (No. of students: 5)
Winter 2016	Evaluation: 4.7/5.0 (No. of students: 10)
Fall 2016	Evaluation: 3.9/5.0 (No. of students: 16)
Winter 2017	Evaluation: 3.9/5.0 (No. of students: 18)
Fall 2017	Evaluation: 4.0/5.0 (No. of students: 11)
Winter 2018	Evaluation: 3.6/5.0 (No. of students: 22)
Winter 2019	Evaluation: 3.2/5.0 (No. of students: 22)
Spring 2019	Evaluation: 3.4/5.0 (No. of students: 12)
Winter 2020 (half online)	Evaluation: 3.4/5.0 (No. of students: 21)
Winter 2022	Evaluation: 2.3/5.0 (No. of students: 7)
Winter 2023	Evaluation: 3.2/5.0 (No. of students: 8)
Winter 2024	Evaluation: on-going/5.0 (No. of students: 8)

<b>Mechanical Systems Design III (B ME 343)</b>	Instructor, University of Washington, Bothell
Covers dynamic system modeling (mechanical, electrical, fluid, and thermos systems); linear oscillator analysis (Laplace transforms, Fourier transforms, eigenvalue problems, and modal analysis);	

performance specifications of feedback control systems; and controller designs for single input single output systems. Includes laboratory experiences.	
Fall 2015	Evaluation: 3.9/5.0 (No. of students: 29)
Fall 2016	Evaluation: 4.2/5.0 (No. of students: 27)
Fall 2017	Evaluation: 4.4/5.0 (No. of students: 46)
Fall 2018	Evaluation: 4.3/5.0 (No. of students: 47)
Fall 2019	Evaluation: 4.6/5.0 (No. of students: 53)
Fall 2021 A	Evaluation: 4.7/5.0 (No. of students: 35)
Fall 2021 B	Evaluation: 4.2/5.0 (No. of students: 17)
Fall 2022 A	Evaluation: 4.1/5.0 (No. of students: 33)
Fall 2022 B	Evaluation: 4.5 /5.0 (No. of students: 12)
Fall 2023 A	Evaluation: 3.9/5.0 (No. of students: 36)
Fall 2023 B	Evaluation: 4.5/5.0 (No. of students: 17)
<b>Mechatronics System Design (MECH 463)</b>	
Instructor, Qatar University	
Introduction and definition of Mechatronics. Analog and digital circuit fundamentals. Microcomputer architecture and applications. Data acquisition systems. Actuation systems: mechanical, hydraulic and pneumatic systems. Programmable logic controllers (PLC). Smart materials and application to intelligent systems. Weekly laboratory	
Fall 2012	Evaluation: 90.00/100 (No. of students: 10)
Fall 2013	Evaluation: 100.00/100 (No. of students: 4)
<b>Engineering Mechanics I, Statics (GENG 221)</b>	
Instructor, Qatar University	
Fundamental concepts and principles of mechanics, vectors, and force systems. Centroids and centers of gravity, Moments of inertia. Concepts of free-body-diagram, principles of equilibrium of particles and rigid bodies in two and three dimensions	
Spring 2010	Evaluation: 93.60/100 (No. of Students: 17)
Fall 2010	Evaluation: 90.59/100 (No. of Students: 21)
Fall 2011	Evaluation: 89.16/100 (No. of students: 30)
Fall 2012	Evaluation: 90.85/100 (No. of students: 39)
Fall 2013 (two groups)	Evaluation: 93.86/100 (No. of students: 32) Evaluation: 95.59/100 (No. of students: 31)
<b>Statics and Dynamics (GENG 220)</b>	
Instructor, Qatar University–Industrial Eng.	
Principles of mechanics. Concepts of free-body diagram, principles of equilibrium of particles and rigid bodies. Fundamental concepts of kinematics and kinetics. Plane motion of rigid bodies. Rectilinear and curvilinear motion of particles. Newton's 2 <sup>nd</sup> law. Dynamics of system of particles. Energy and momentum methods	
Spring 2010	Evaluation: 91.75/100 (No. of Students: 25)
<b>Mechanical Mechanisms (MECH 321)</b>	
Instructor, Qatar University	
Introduction and Kinematics fundamentals. Position analysis and graphical linkage synthesis. Velocity and acceleration diagrams for mechanisms. Cam and cam design. Dynamic force analysis, Gear trains. Weekly laboratory experiments.	
Fall 2009	Evaluation: 91.14/100 (No. of Students: 21)
Fall 2010	Evaluation: 94.12/100 (No. of Students: 4)

Fall 2011	Evaluation: 96.18/100 (No. of students: 30)
<b>Control Systems (MECH 361)</b>	Instructor, Qatar University
Introduction to control systems. Mathematical models for various feedback systems. Transfer functions. State space representation. System time and frequency responses. Performance specifications of feedback control systems. Analysis and design of systems by means of root-locus and frequency response methods. Compensation techniques. Computer-aided control system design of single input single output systems. Weekly laboratory experiments.	
Spring 2010	Evaluation: 86.71/100 (No. of Students: 18)
Spring 2011	Evaluation: 83.06/100 (No. of Students: 12)
Spring 2012	Evaluation: 84.76/100 (No. of Students: 19)
Spring 2013	Evaluation: 86.55/100 (No. of students: 16)
<b>Engineering Mechanics II, Dynamics (GENG 222)</b>	Instructor, Qatar University
Fundamental concepts of kinematics and kinetics with application of particles and plane motion of rigid bodies. Rectilinear and curvilinear motion of particles. Newton's second law, impulse and momentum methods, impact. Dynamics of systems of particles. Kinematics of rigid bodies. Plane motion of rigid bodies: Forces and accelerations	
Spring 2011	Evaluation: 89.81/100 (No. of Students: 37)
Spring 2012	Evaluation: 88.41/100 (No. of Students: 24)
Spring 2013	Evaluation: 90.96/100 (No. of students: 34)
Spring 2014 (two groups)	Evaluation: N/A (No. of students: 26 & 29)
<b>Introduction to System Dynamics (ME 373)</b>	Teaching Assistant, University of Washington
Topics covered were mathematical modeling, analysis, and design of physical dynamic systems. Led 10 weekly laboratory experiments and taught hands-on experimental procedures and data acquisition/analysis of time-domain response of mechanical, electrical, and fluid systems. Training covered numeric simulation using LabVIEW, MATLAB, and laboratory instruments.	
Winter 2008	Evaluation: N/A (No. of Students: 50)
<b>Introduction to Mechanical Design (ME 395)</b>	Teaching Assistant, University of Washington
Taught design process and methodology, decision making, optimization techniques, project planning, engineering economics, probabilistic and statistical aspects of mechanical design, ethical and legal issues. Conducted quiz section and labs section meetings maintaining website for course materials.	
Spring 2007	Evaluation: N/A (No. of Students: 35)

## ACADEMIC ADVISING ACTIVITIES

### University of Washington, Bothell

- **Non-ME Research Project Advisor, University of Washington,**
  - Brooke Ojala (Pre-major), Collaborative Robot with a Portable Ultrasound Machine project (2 credit/Fall' 23, Winter24)
  - Yanda Bao (Skyline High School in Sammamish WA), Collaborative Robot with a Portable Ultrasound Machine project, 2023 summer
  - Aakanksha Patel (MS, Physics, UW Seattle), collaborative robot arm project, 2022-2023
  - Nawal Hersi (BSEE), collaborative robot arm project, (2 credit/win'22, Spr' 22)

- Carla Colaianne (MSCSE), Thesis Advisors: Erika Parsons, Johnny Lin, Nancy Kook, Jong Yoon, Developing Autonomous Mining Through a Simulation and Deep Reinforcement Learning. Autumn 2021.
- **Advisors:** Mourad PD, Jong Yoon (ME), Early J (Nursing and Health Studies at UWB) and Bunnell A (Rehabilitation Medicine). Smart Robot for rehabilitation after Stroke, Olivia Oomen (Pre-major), Madison Dienhart (CSSE), Haley Read (ME), Olga Kuriatnyk (CSSE), Lilia A. Matevosyan (Health studies), Autumn 2020 – present
- Young Beum Cho (EE, STEM, Undergraduate study), Height adjustable smart wheelchair (2credit/fall'18, 2credit/win'19, 2credit/spr'19, 2credit/fall'19, 2credit/win'20)
- Patrick Alan McCurry (MSEE, BEE 600B Independent study), Tethered capsule project (2credit/spring'17), Collaborative Robot project (3credit/summer'17, 1credit/fall'17, 1credit/winter'18)
- Peter Wonkey Chung (EE, STEM, EE 499 Independent Study), Tethered capsule project, user interface (5credit/winter'18)
- Elizabeth Mun-Wai Broadwell (Non-ME, UWS, Undergraduate study), Tethered capsule project, CO2 sensor (2credit/fall'17)
- Michael Yacoub (BioChem, STEM, BST 499B, Undergraduate study), Measurement and Verification of CO2 gas sensor for Helico pylori infection, 2015 Fall – 2016 Winter (3credit/fall '15, 3credit/winter '16)
- **ME Undergraduate Research Project Advisor, University of Washington Bothell, Mechanical Engineering**
  - Beck Rice-Narusch (BSME), Collaborative Robot with a Portable Ultrasound Machine project (2 credit/Fall' 23, Winter24)
  - Ethan Han (BSME), Collaborative Robot with a Portable Ultrasound Machine project (2 credit/Fall' 23, Winter24)
  - Vyom Pulivendula (BSME), Collaborative Robot with a Portable Ultrasound Machine project (2 credit/Win' 23, 1 credit/Spr' 23, 2 credit/Fall 23)
  - Asim Burak, Human perception project – haptics (2 credit/Spr' 22, 2 credit/fall 22)
  - Vladmir Roca, collaborative robot arm project – kinematics and vision (2 credit/fall 22, Win'22, Spr' 22)
  - Samuel Ionesi, Sustainability of In-Situ Resource Utilization: Lunar Steel Stock Production, independent study (4 credit/sum'20)
  - **Advisor**, Hollomon Health Innovation Challenge, 2020, UW Foster School of Business, Joseph Mertens, Daryl Hurwitz, DELTA-3 data glove,
  - **Advisor**, Hollomon Health Innovation Challenge, 2020, UW Foster School of Business, Dennis Igawa, John Pham, Nick Debrasse, Simon Rockhold, Rehabilitation, Within Arms Reach -- **Finalist**
  - Dennis Igawa, Robot palpation study (2credit/win'19, 2credit/spr'19)
  - Joseph Mertens, Jessica Hailey, Tethered capsule project, user interface (2credit/win'19, 2credit/spr'19, 2credit/fall'19, 2credit/win'20)
  - Daryl Hurwitz, Height adjustable smart wheelchair (2credit/fall'18, 2credit/win'19, 2credit/spr'19, 2credit/fall'19, 2credit/win'20)
  - Nick deGrasse, Wheelchair seats and restroom use (2credit/summer'18, 4credit/fall'18, 2credit/win'19, 2credit/spr'19, 2credit/fall'19, 2credit/win'20, 2credit/spr'20)
  - Sue Burns, Collaborative Robot project, force sensor (2credit/winter'18, 2credit/spring'18)
  - Dawson Brown, Collaborative Robot project, user interface design (2credit/summer'17, 2credit/fall'17)
  - Seungbo Ha, Automated Bladder Surveillance System, 2017 Spring (2credit/spring'17), Tethered capsule project (2credit/fall'17, 2credit/winter'18)
  - Perapat Tantawarak, Smart Multifunction Toilet Wheelchair, 2017 Spring - present (2credit/spring'17, 2credit/fall'17, 2credit/winter'18)

- Daniel C. Robinson, (ME major, STEM), Smart Multifunction Toilet Wheelchair, 2017 Winter - present (2credit/win'17, 2credit/spring'17, 2credit/fall'17, 2credit/winter'18)
  - Shayan Ebrahimi, Yang Bai, Daniel Bui Huynh, Carpal Tunnel Assistive Devices, 2016 Summer – Fall (3\*2credit/summer'16, Shayan & Daniel 2\*2credit/fall '16))
  - Young-Man Ashworth and Huy Hoang, Design of Exoskeleton for arthritis patient, 2016 Spring – Fall (2\*2credit/spring'16, fall '16)
  - Vincent Vic Valdez, Smart Multifunction Toilet Wheelchair, Winter 2016 – Winter 2017 (2credit/spring '16, 2credit/summer'16, 2credit/fall'16, 2credit/win'17)
  - Andy Chapman, Design of Exoskeleton for arthritis patient, 2014 Fall – 2015 Summer (2credit/summer '15)
  - Megan Hewitt, Cystoscope project, 2015 Summer – 2016 Winter (2credit/summer '15, 2credit/fall '15, 2 credit/winter '16)
  - John Lynch, Simranjeet Singh, Continuum multi-DOF shaft design, 2014 Fall (2\*2 credit/fall '14)
- **ME Capstone Design Project Advisor, University of Washington Bothell, Mechanical Engineering**
    - Team: Rebecca Sasten, Vladimir Roca, Li-Ling Plume, Devin Taing, Physically Connected Vehicles (Fall 2022 ~ Spring 2022)
    - Team: Dennis Igawa, John Pham, Nick Debrasse, Simon Rockhold, Rehabilitation, Within Arm's Reach (Winter 2020, Spring 2020)
    - Team: Zane Bacon, Sue Burns, Brandon Carlson, Paul Cooper, Remotely Operated Boat (Winter, Spring 2019)
    - Team: Allen A. Do, Michael T. Teng, Denis Rybchenko; Margaret Deleo, (Winter, Spring 2019)

#### Qatar University

- **Advisor, Master of Science in Engineering Management Project (EMP), Qatar University,** Department of Mechanical and Industrial Engineering,
  - Amera Al-Mannai, 2013 fall, *Cost Effectiveness Analysis of Automated Bladder Surveillance System (ABSS)*
- **Advisor, Master of Science in Mechanical Engineering (MSME), Qatar University,** Department of Mechanical and Industrial Engineering,
  - Ahmed Mohamed El-Noamany, 2012 fall – 2013 fall
- **Intern Advisor,** Yasir Salih Osman (PhD student), Universiti Teknologi PETRONAS, Perak, Malaysia, *Development of an embedded image processing unit for the toilet friendly wheelchair sensing system using 2D triangulation*, 2012 December – 2013 February.
- **Undergraduate Research Advisor, University of Washington,** Seattle, Department of Mechanical Engineering, Matthew Ryan Burkhardt, *Controlling the Trajectory of a Scanning Fiber Endoscope for Automatic Bladder Surveillance*, 2011 spring – summer.
- **Undergraduate Senior Project Advisor, Qatar University,** Department of Mechanical and Industrial Engineering
  - Faisal Ibrahim Jaber, *ABB Technology and Qatar University Student Projects on Robotics*, Department of Mechanical Engineering, 2011 Fall, 2012 Spring, Demonstrated at *the 20<sup>th</sup> World Petroleum Conference and Exhibition*, National Convention Center, December 4<sup>th</sup> -8<sup>th</sup>, Doha, Qatar
  - Khalid Al-Fahad, Omar L. Aljammal, Khaled Hussein, *Design and Development of an Arabic Speech-Controlled Multifunction Toilet-friendly Wheelchair*, 2011 Spring, 2011 Fall. Co-advised CSE undergraduates, Hind Almerkhi and Khansa Chemnad Abdul Jaleel

- Haitham Jamal Alkababji, Ahmed Hashim Hamouda, Abdullah Zakaria Atia, *Discrimination Thresholds for Haptic and Visual Sensory Information*, 2010 Fall, 2011 Spring
- Firas, Zirie, Mustafa, Thamer, Mohammed Hafes, *Design of a Formula SAE Racing Car*, 2010 Spring, 2010 Fall.
- Nasser Jassim AL-Obaidli, Abdulrahman Nooh AL-Zahed, *The Potential of Stand-Alone Photovoltaic System Technology in Qatar*, 2009 Fall.

## PROFESSIONAL COMMITTEES

- **Session Co-Chair, C-3, Mechanical, Aerospace, and Naval Engineering (MAN)**, 2023 US-Korea Conference on Science, Technology and Entrepreneurship, Dallas, Texas, USA, August 2 – 5, 2023
- **Associate Editor (AE), IEEE Robotics and Automation Letters, RA-L**, 2023 ~ present
- **General co-chair and Program chair, KSEA North-West Regional Conference (NWRC) 2022**, November 11-12, Seattle, WA, <https://seattle.ksea.org/nwrc2022/>
- **Reviewer, NSF Graduate Research Fellowships Program (GRFP)**, 2020 and 2021
- **Review Editor**, Frontiers in Nanotechnology – Nanodevices, 2019 – present
- **General co-chair and Program chair, KSEA West Regional Conference (WRC) 2019**, November 2, 2019, Bellevue, WA: <https://seattle.ksea.org/wrc.html>
- **Associate Editor (AE), Ubiquitous Robotics (UR) 2018**: <http://www.ubiquitousrobots.org/2018/index.php>
- **Session Co-Chair, Medical Robots session**, the 14th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI), June 28 - July 1, 2017, Jeju, Korea
- **Associate Editor (AE), Conference Editorial Board (CEB) of the IEEE Robotics and Automation Society for ICRA 2016** (<http://www.icra2016.org>), **ICRA 2017** (<http://www.icra2017.org>), **ICRA 2018** (<http://www.icra2018.org>), and **ICRA 2019** (<https://icra2019.org/>)
- **Review Editor**, Editorial Board of Frontiers in Bionics and Biomimetics, a specialty of Frontiers in Bioengineering and Biotechnology and Robotics and AI, 2015- present
- **Session Moderator**, Hands on Learning, the ASEE PNW Section Conference 2016, Boise
- **Advisory/Editorial Board**, International Journal of Energy, Information and Communications, 2011 – present
- **Program Committee**, CIS-RAM 2015 (IEEE Int. Conf. on Cybernetics and Intelligent Systems (CIS) Robotics, and IEEE Int. Conf. on Automation and Mechatronics (RAM), [[www.cis-ram.org](http://www.cis-ram.org)])
- **Session co-chair (Biorobotics)**, The 7th IEEE International Conferences on Cybernetics and Intelligent Systems (CIS), and Robotics, Automation and Mechatronics (RAM), 15-17 July, 2015, Angkor Wat, Cambodia
- **Track Chair (Urologic), Scientific Program Committee Member, Design of Medical Devices Conference (DMD)**, Minneapolis, 2011- present.
- **Associate editor** (Biomechanics, Biomaterials and Tissue Engineering) and **Track Co-Chair**, Middle East Conference on Biomedical Engineering (MECBME'14), Doha, Feb. 17-20, 2014
- **Organizer**, Special Sessions (s15: Towards Autonomous Learning Machines), The 19th International Conference on Neural Information Processing (ICONIP 2012), Doha, Qatar, November 12-15, 2012.
- **International Program Committee (IPC), ICCAS 2012 (12th International Conference on Control, Automation and Systems)**, Jeju Island, Korea, 2012
- **Scientific Committee Member, CompIMAGE 2012 Conference**-Computational Modeling of Objects Presented in Images: Fundamentals, Methods and Applications, Rome (Italy) from 5th to 7th of September 2012.
- **Scientific Committee Member, 6th International Conference on Technology and Medical Sciences (TMSi2010)**, October 2010, Porto, Portugal.

- **Scientific Committee Member**, VipIMAGE2011 - 3rd ECCOMAS (**European Community on Computational Methods in Applied Sciences**), Thematic Conference on Computational Vision and Medical Imaging Processing, 2011 October, Algarve, Portugal.
- **ABET Quality Assurance Committee**, MIE Department, Qatar University, 2009 – present.
- **Research and Graduate Studies Committee**, College of Engineering, Qatar University, 2010 - present
- **Research Committee**, MIE Department, Qatar University, 2009 – present

## PROFESSIONAL AFFILIATIONS

- American Society of Mechanical Engineers (ASME) member, 2004 - present
- IEEE member, 2010 – present
- Rehabilitation Engineering and Assistive Technology Society (RESNA) member, 2021 – 2022
- Society of Manufacturing Engineers (SME), 2014 - 2020
- American Society of Engineering Education (ASEE) member, 2016 - 2023
- Korean American Engineers and Scientists Association (KSEA) member, 2005 – present

## UNIVERSITY AND COMMUNITY SERVICE/ACTIVITIES

### University of Washington, Bothell

- Committee member, **Mechanical engineering Assistant Teaching Professor Faculty Search Committee**, 2023-2024
- **General Faculty Organization Representative**, Cascadia College | University of Washington Bothell **Campus Design Review Team (CDRT)**, 2023-2024.
- Member, **FTE Policy Working Group**, Spring – Summer, 2023.
- **Chair, UWT School of Engineering & Technology Program Review Committee**, 2023-2024.
- Committee member, **the UW’s inaugural Advisory Committee on Intellectual Property, Policy and Practice (ACIP3)**, with “reviewing, from a fresh perspective, the UW’s IP policies and practices, and evaluating whether they further the UW’s goals to simulate discovery, preservation and dissemination of knowledge, information, art and technology by and among faculty, students, staff and the public.”, Feb. 17, 2023 ~ present
- **Faculty advisor, Electric Motorsport Club** at UWB, October 2022 – present
  - **evGrand Prix**, Purdue Racing Track, April 14-15, 2023
  - **Shell Eco-marathon Americas 2024**, April 3-7, 2024
- **Faculty Mentor, Research Experiences for Undergraduates (REU)** from Heritage University, “Automating a Diagnostic Ultrasound Imaging Exam”, summer 2022, June 12 – August 19
  - Maria Barrios Hernandez, Eric Mendoza
- **Engineering faculty mentor, First Year and Pre-Major Program (FYPP)**, Pathways Week, Winter 2022, Winter 2023
- Committee member, **E&M Part-time Faculty Review Subcommittee**, 2021-2022
- Committee Member, Thomas Humphries’s **P&T subcommittee**, 2021
- Committee Member, School of STEM **Faculty Search Committee**, Lecturer Part-Time Competitive in Mechanical Engineering, 2020 Spring - Summer
- Committee Member, Shima Abadi’s **P&T subcommittee**, 2020
- Member, UW Bothell **Faculty Research Advisory Council**, Feb. 2020- present
- Committee Member, Mechanical Engineering **Faculty Search Committee, UW Tacoma (4 faculty members, one full/associate & 3 assistant professors)**, September 2019 – April 2020
- **Program Coordinator**, Mechanical Engineering, Division of Engineering and Mathematics, September 2019 - present



- Committee Member, **Makerspace Learning Community**, September 2019 - present
- **Chair**, Pietro Paparella's **P&T subcommittee**, 2019
- Committee Member, **Worthington Funds Review Committee**, Oct. 2018 - present
- Committee Member, **E&M Diversity Committee**, Feb. 2019 – June 2019
- **ABET coordinator**, Mechanical engineering, 2017 - 2018
- **UWB Faculty Senate representative**, September 16, 2016 - September 15, 2018, September 16, 2018 - September 15, 2020,
- Member, School of STEM Search Committee for ABET Coordinator and Personnel Processes support staff, 2017 Spring.
- **Faculty advisor, Society of Manufacturing Engineering (SME) Student Chapter** at UWB May 2016- 2020.
- **Faculty advisor, ASME Student Chapter** at UWB, Jan 2016 - present
- **Faculty Advisor**, TrickFire Robotics Club, University of Washington Bothell, 2016 – present
  - NASA Robotic Mining Competition 2017 May 22-26
  - NASA Robotic Mining Competition 2018 May 14-18
  - NASA Robotic Mining Competition 2019 May 6-10
  - NASA Robotic Mining Competition 2020 (Cancelled)
  - NASA Robotic Mining Competition 2021 (Virtual)
  - University Rover Challenge (URC) 2023 – not selected for final round
  - University Rover Challenge (URC) 2024
- Panelist, Computer Code and Your Career, UW Bothell chapter of the Society of Manufacturing Engineers (SME) and ASME, November 14, 2016, Discover Hall, Maker Space
- Temporary **STEM EC representative** (Standing in for Jeffery Jensen), The Executive Council (EC) of the GFO, 2016 Fall
- **Assistant coordinator**, School of STEM **ABET committee, 2016 – 2017.**
- Member, School of STEM Search Committee for Mechanical Engineering Lab Coordinator, 2016 Fall.
- **Member, Petition committee for E&M Grad Program**, 2016 - present
- **Reviewer**, UW Bothell Founder’s Fellow Research and Creative Practice Scholarships, 2015
- **Chapter President**, Korean American Engineers and Scientists Association (KSEA) Pacific Northwest chapter, 2015 - present.
- **Exhibitor** (Robot Doctor), the Inspire STEM Festival, UWB October 12<sup>th</sup>, 2015
- Member, School of STEM Search Committee for Professor-of-Practice in Systems Engineering, 2015 Fall – 2016 Spring.
- Member, University of Washington Graduate Faculty, 2015- present.
- **Faculty advisor**, Badges for college credit (BCC), to develop a system to associate informal science learning with college credit. The project partners with three regional informal science institutions, the Pacific Science Center, the Future of Flight and the Seattle of Aquarium. 2015 Fall – present.
- Member, School of STEM **ABET committee**, 2014 - present.
- Member, School of STEM **Search Committee** for Thermofluids/Ocean Engineering TT Faculty, 2014 Fall – 2015 Spring.
- Member, School of STEM Search Committee for Electrical Engineering TT Faculty, 2014 Fall – 2015 Spring.

Qatar University

- **Advisor, Stars of Science season 4** (SOS, [www.starsofscience.com](http://www.starsofscience.com)), Saud Al-Shammari ‘Mechanical shoes for orthopedic patient’, Amina Alhawaj ‘Lower Limb Rehabilitation Device’, February – June, 2012
- **Forum coordinator**, Advance health informatics and engineer better medicines, National Academy of Engineering Grand Challenges Forum, May 9th, 2011.
- **Chair**, Biomedical Engineering Workshop, CENG Research and Graduate Studies Week College of Engineering, Qatar University, March 27 – 30<sup>th</sup>, 2011.

#### Others

- Local coordinator, UWB-Hannam University, micro-design challenge, July 3-10, 2023.
- Mentor, Hannam Design Factory, Hannam University, Korea,
  - Teams: ECORE, 2023 Fall
  - Teams: SingleBungle, MyungPoong, 2023 Spring
  - Teams: Bumrang, K-Lean, 2022 Fall
  - Teams: Dodamdodam, HIST, 2022 Spring
  - Team: K-Waterman, Sponsor: K-Water(한국수자원공사), 2021 Fall
  - Team: HyunDAY, Sponsor: Hyundai Engineering and Construction, 2021 Spring
- Committee member, **Honors and Awards Committee, Korean American Engineers and Scientists Association (KSEA)**, (2020-2023)
- Committee member, **APS Committee, Korean American Engineers and Scientists Association (KSEA)**, 48<sup>th</sup> term (2019 – 2020).
- **Chapter President Chair (CPC), Korean American Engineers and Scientists Association (KSEA)**, 46<sup>th</sup> and 47<sup>th</sup> terms (2017 – 2019).
- Committee member, Contest Committee, **Korean American Engineers and Scientists Association (KSEA)**, 46<sup>th</sup> term (2017 – 2018).
- **Chapter president, Korean American Engineers and Scientists Association (KSEA), Seattle Chapter**, 44 (acting), 45, 46, and 47<sup>th</sup> terms (Nov. 2015 – June 2019)
- **Research Proposal Reviewer**, National Medical Research Council (NMRC), under the Ministry of Health, Singapore, 2017
- **Reviewer, IEEE/ASME Transactions on Mechatronics**, 2009 – present
- **Reviewer, IEEE/ASME Transactions on Biomedical Engineering**, 2012 – present
- **Reviewer, Journal of Microscopy**, 2014 – present
- **Reviewer, International Journal of Precision Engineering and Manufacturing (IJPEM)**, 2009 - present
- **Reviewer, Journal of Mechanical Science and Technology**, 2013 – present
- **Research Proposal Reviewer**, The Emirates Foundation for philanthropy, Abu Dhabi, United Arab Emirate, 2010 - present
- **Reviewer**, ASME Word Conference on Innovative Virtual Reality (WINVR 2011)
- Member of University of Washington **Toastmasters Club**, October 2003 – August 2009  
Vice President of University of Washington Toastmasters club, July 2005 - June 2008  
Recognized as an **Advanced Toastmaster Silver (ATM-S)**, August 2009
- Advisor, Science Olympiad, North Shore Junior High school, 2016 Fall - present
- **Director of National Mathematics Competition of Korean American Engineers and Scientists Association (KSEA) Pacific Northwest chapter**, 2005 – 2009, 2014 - present.
- **Volunteer Assistant Teacher, Readings in Contemporary Korean**, University of Washington, Autumn 2008
- Organization committee of KSEA Northwest Regional Conference (NWRC), 2006 - 2009
- Vice President of Korean Graduate Student Association (KGSA) at the University of Washington, September 2004 - September 2005
- **Executive committee of the Reserve Officers’ Training Corps (ROTC)**, 1994 – 1995

## TECHNICAL SKILLS/CERTIFICATES

- Cybor.org, “Cybersecurity with Python & micro:bit” Three-session Educator’s Workshop July 25, 27, & 29, 2022
- Cyber.org, “Shield-Bot for Arduino Distance Learning” Workshop, Parallax, March 14-18, 2022
- Universal Robots Core Training (certificate number: E20220312146740), Olympus Controls, March 10-11, 2022
- Universal Robots, e-Series Core and Pro Track, online learning, March 2022
- LabVIEW Boot Camp, National Instrument, University of Washington, Sept 18-22, 2017
- Programming & computing tools: NI LabVIEW, MATLAB, C, C++, MS VC++, Mathematica, ANSYS, COMSOL Multiphysics (FEMLAB), ADAMS, SolidWorks, Rhinoceros CAD, and Microsoft Office
- Apply statistical & failure analysis to most projects with the proper methodological tools, such as Six Sigma, to eliminate process variation. Have extensive experience with Six Sigma Statistics software applications (Minitab)
- Extensive experience in precision motor test setups, quality control, and clean-room management
- Languages: Korean (Native), Japanese (Conversant and reading)

## RESEARCH COLLABORATORS

- **Eric Seibel**, Research Professor,  
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- **Blake Hannaford**, Professor,  
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University of Washington, WA, USA
- **John B. Troy**, Professor, Chair,  
Biomedical Engineering,  
Northwestern University, IL, USA
- **Hyook Ryeol Choi**, Professor, Chair  
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Department of Mechanical Engineering,  
Sungkyunkwan University, Korea
- **Yoon Sang Kim**, Professor,  
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Korea University of Technology and Education, Korea
- **Per G. Reinhall**, Professor, Chair,  
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University of Washington, WA, USA

- **Thomas S. Lendvay, M.D.**,  
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Seattle Children's Hospital, Seattle, WA, USA
- **Sangtae Park, M.D.**,  
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University of Chicago Pritzker School of Medicine, Chicago, IL, USA
- **Sameer Sonkusale**, Professor,  
Nanoscale Sensors, Integrated Circuits and Metamaterials Laboratory,  
Electrical and Computer Engineering,  
Tufts University, MA, USA
- **Robert M. Sweet, M.D.**, Professor of Urologic Surgery,  
The Center for Research in Education and Simulation Technologies (CREST),  
University of Minnesota in Minneapolis, MN, USA
- **Joel C. Perry, PhD**, Associate Professor  
Department of Mechanical Engineering  
University of Idaho, ID, USA
- **Matthew A. Brown, PhD**,  
Research Scientist at Google.
- **Sanggyeun Ahn, PhD**, Professor  
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University of Washington, WA, USA
- **John-John Cabibihan, PhD**, Professor  
Mechanical and Industrial Engineering department,  
Qatar University, Qatar
- **Julien Abi Nahed, PhD**, Lead R&D Executive  
Qatar Robotic Surgery Center (QRSC)  
Qatar Science and Technology Park (QSTP), Qatar

- The end -