W. JONG YOON, Ph.D.

Mechanical Engineering, Program Coordinator
School of Science, Technology, Engineering & Mathematics
University of Washington, Bothell
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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:** design of multi-modal medical diagnostic devices; robot surgery; human computer interface; smart sensors and actuators; assistive/adaptive devices for the disabled
- **Teaching Interests**: machine design, mechatronics systems design, mechanism, 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

Bachelor of Engineering, Mechanical Engineering, March 1995
Hong Ik University, Seoul, Korea (south)

SPONSORED RESEARCH/GRANTS

Funded

- **PI**, Prototype Fund recipient, Hollomon Health Innovation Challenge, 2019-2020
  Team Apex Design Haus, "Endoscopic User-Interface" project, $ 2,100
- **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), Student Technology Fee, UW Bothell, $20,000 2017
- **Advisor**, TrickFire Robotics, Student Technology Fee, UW Bothell, $10,000 2016
- **PI**, 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, US $47,477

Submitted or In-preparation

- **PI, NSF Multimodal Sensor Systems for Precision Health Enabled by Data Harnessing, Artificial Intelligence, and Leaning (SenSE), (**Submitted 06/08/20, Proposal #: 2037439- not awarded), SenSE: Soft Robotics and Active Sparse Learning Models for Mass and Remote Cancer Surveillance
- **PI, Royalty Research Fund (RRF,** eGC1 A154839), (submitted, 3/3/2020 – not awarded), Study on Soft Robotic Articulation for Tethered Capsule Endoscopy
- **PI, UW Bothell Scholarship, Research, and Creative Practice (SRCP) Seed Grant**, (submitted, 4/24/2020 – not awarded), Study on Soft Robotic Articulation of a Flexible Image Retrieval System for Mass Cancer Screening
- **PI, NSF Smart and Connected Health, (**Submitted 12/11/19, Proposal #: 2014273 – not awarded), SCH: INT: Collaborative Research: Soft Robotics and Active Sparse Learning Models for Mass and Remote Cancer Surveillance
- **PI, Royalty Research Fund (RRF,** eGC1 A149695), (submitted – not awarded), 9/30/2019, Study on Soft Robotic Articulation for Tethered Capsule Endoscopy
- **PI, CoMotion Innovation Gap Fund**, (8/21/2019 – not awarded), Roll-over-toilet
- **PI, Washington Research Foundation Technology Commercialization grant**, (Pre-proposal submitted 5/1/2019, full proposal submitted 5/25/2019 – not awarded), Modular kit development for the safe and easy use of public restrooms for wheelchair Patients
- **PI, NSF Smart and Connected Health, (**Proposal submitted 12/11/18 – not awarded), SCH: INT: Collaborative Research: The Integration of Intelligent Endoscopic System and Computer-Aided Approach for Mass and Remote Diagnosis
- **PI, NSF Smart and Connected Health, (**Proposal submitted 5/22/18 – not awarded), SCH: INT: Collaborative Research: The Integration of Intelligent Endoscopic System and Computer-Aided Approach for Mass and Remote Diagnosis
- **PI, NSF Smart and Connected Health, (**Proposal submitted 12/8/16 – not awarded), Intelligent Bladder-Endoscopic System For Remote Diagnosis
- **PI, Amazon Catalyst**, (Proposal submitted 11/20/16 – not awarded), Smart Multifunction Toilet Wheelchair (SMTW)
- **PI, Intuitive Surgical Technology Research Grants** (LOI submitted 06/03/16 – not awarded), Design and evaluation of an articulated imaging probe for generation of additional visual cues in minimally invasive robotic surgery
- **PI, Royalty Research Fund (RRF,** eGC1 A112521) (re-submitted – not awarded), 3/5/2016, Development of Integrated Multi-modal Flexible Endoscope Platform for Improved Diagnostic Yield of Gastric H. pylori Biopsy
- **PI, CoMotion Innovation Fund** (LOI re-submitted – not awarded), 2/26/2016, Smart Multifunction Toilet Wheelchair
- **PI, CoMotion Innovation Fund** (Proposal NO: F2015-7534_Yoon) (submitted - not awarded), 9/22/2015, Smart Multifunction Toilet Wheelchair
- **PI, NSF CAREER** (Proposal NO: 1552689) (submitted-not awarded), 7/21/2015, Highly Integrated Intelligent Gastro-Endoscopic Diagnostic System

- **PI, Royalty Research Fund (RRF,** eGC1 A101913) (submitted-not awarded), 3/3/2015, Development of Integrated Multi-modal Flexible Endoscope Platform for Improved Diagnostic Yield of Gastric H. pylori Biopsy
- **Co-PI**, Concept Paper (1261-2676) (submitted-not awarded), **ARPA-E**, 2/26/2015, Physically Connected Vehicles
- **Co-PI**, **Qatar National Research Fund**, 8th Cycle (Submitted-not awarded), Transfer of human haptic perception during the minimally invasive robotic surgery through sensorized surgical robotic system (NPRP8-1537-2-653)

HONORS & AWARDS

- **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**
- **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 24th 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. 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
2. Junho Ko, *W. Jong Yoon*, and Yoon Sang Kim, A Study on Surgical Robot Image Stabilization, Multimed Tools Appl (2017). https://doi.org/10.1007/s11042-017-5330-5
3. 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)
4. 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**)
5. 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

6. 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
7. 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.
8. 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)
9. 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)
10. 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)
11. *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.
12. 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)
13. *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)
14. 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)
15. *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)
16. *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)
17. *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. Nicholas deGrasse, W. Jong Yoon, A foldable Wheelchair Seat for Easier Restroom Access (will be submitted to RESNA 2021 Annual conference)
2. John-John Cabibihan, Ahmad Yaser Alhaddad, Tauseef Gulrez, and *W. Jong Yoon*, (submitted to IEEE Robotics and Automation Letters, RA-L, in Jan 2021), Influence of Visual and Haptic Feedback on the Detection of Threshold Forces in a Surgical Grasping Task
3. Siva M. Tangutooru, Faris Tarlochan, *W. Jong Yoon*, and John B. Troy (submitted to *Journal of Computational Neuroscience* in June 2016), Computational Model of a Thalamocortical Neuron for Neural Prostheses

Peer-Reviewed Conference Proceedings

1. *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
2. 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 14th International Conference on Ubiquitous Robots and Ambient Intelligence, June 28 – July 1, 2017, Jeju, Korea
3. *W. Jong Yoon*, CAD vs. Modeling, Design, and Analysis?, ASEE Pacific Northwest Section Conference 2016, Boise, Idaho
4. 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.
5. Xianming Ye, Cyril Hasson, *W. Jong Yoon*, John-John Cabibihan, Design of a Steering Mechanism for a Tethered Capsule Endoscope, 7th IEEE International Conference on Cybernetics and Intelligent Systems (CIS) and the 7th IEEE International Conference on Robotics, Automation and Mechatronics (RAM), 15-17 July, 2015 at c, **Best Student Paper Award – Finalist**.
6. 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.
7. 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
8. 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
9. Xianming Ye and *W. Jong Yoon*, Preliminary Design of a Bending Mechanism for Automated Cystoscope, The 8th 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
10. 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
11. 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
12. 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
13. 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
14. *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.

15. *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.
16. *W. Jong Yoon*, Matthew A. Brown, Eric J. Seibel, Automated Cystoscopic Surveillance System with Endoscopic Image Mosaicing, *The 12th Mechatronics Forum Biennial International Conference*, Swiss Federal Institute of Technology, ETH Zurich, Switzerland, June 28-30, 2010, book ½, pp. 86-90.
17. *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* 24th Annual Meeting, Chicago, IL, April 25th 2009. **Ranked Top 10** among the 127 submitted to the E&U meeting.
18. *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* 23rd Annual Meeting, Orlando, FL, May 17th 2008. *Journal of Endourology*, 22(11), November 2008, pp. 2595
19. *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 2nd Frontiers in Biomedical Devices Conference, BioMed 2007-38059*, Irvine, CA, June 7-8, 2007, pp.57-58.

ABSTRACTS/POSTERS AND TALKS

1. 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
2. *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)
3. *W. Jong Yoon*, Embedded systems, IOT Devices and Electronics Pre-Hackathon, UWB Makerspace, March 31, 2017
4. *W. Jong Yoon*, 11th North West Regional Conference, October 29-30, 2016, San Jose, CA
5. 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
6. 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
7. *W. Jong Yoon*, How to apply creativity and innovation toward currently unmet clinical needs, *Research In Progress*, Spring 2015, B CUSP 290
8. 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, *2nd International Conference on Label-Free Technologies*, 12-14 March 2015, Boston Marriott Cambridge, MA, USA
9. Ayub Mohammed, Mohammad Hassan Mohammad Khorasani1, 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
10. 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
11. 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, 29th Annual meeting, May 17, 2014, Hyatt Regency, Orlando, FL, USA, **Top 10 Abstracts Award.**

12. Cyril Hasson, *W. Jong Yoon*, Navigation capabilities for a flexible tethered capsule endoscope, *Qatar Foundation Annual Research Forum* 2013, Doha, Qatar
13. 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
14. 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.**
15. **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, England 11-13 December 2012
16. 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 5th, 2011.
17. 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 12-13th, 2010.
18. Invited talk, "Qatar, Qatar University and Smart Medical Devices Lab.", College of Engineering, Konkuk University, Seoul, Korea, July 14th, 2010.
19. QU Research Forum-2010, Session 6, Health 2, *In Vitro T*est of An Automated Cystoscopic Procedure for Bladder Surveillance, May 5, 2010.
20. 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.
21. 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 9th, 2008.
22. Conference presentation, "Active Steering Mechanism for Bladder Tumor Surveillance", The 3rd KSEA Northwest Regional Conference, University of Phoenix, Sacramento, CA, Nov 1st, 2008.
23. Invited talk, "Efficient Automated Bladder Urothelium Imaging", Young Generation Professional Forum, KSEA Pacific Northwest Chapter, Hilton Hotel, Bellevue, WA, March 1st, 2008
24. Conference presentation, "Steerable Ultrathin Scanning Endoscope Development for Image-guided Interventions", The 17th Annual KSEA South-Western Regional Technology Conference, Hilton Pasadena, CA, February 10th, 2007
25. 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 9th 2007

PATENTS/ INVENTION DISCLOSURES

Patents

1. *W. Jong Yoon*, Sang-gyeun Ahn, "Multifunction Toilet Wheelchair", USPTO, Patent Application 16/911,246 filed 6/24/2020, 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, #20090208143

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

Introduction to Mechatronics (B ME 460)	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)

Statics (B ME 221)	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)

Dynamics (B ME 223)	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)

Intro to 3D Modeling, Design, and Analysis (B ME 315)	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)

Mechanical Systems Design III (B ME 343)	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)

Mechatronics System Design (MECH 463)	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)

Engineering Mechanics I, Statics (GENG 221)	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)

Statics and Dynamics (GENG 220)	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 2nd law. Dynamics of system of particles. Energy and momentum methods	
Spring 2010	Evaluation: 91.75/100 (No. of Students: 25)

Mechanical Mechanisms (MECH 321)	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)

Control Systems (MECH 361)	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)

Engineering Mechanics II, Dynamics (GENG 222)	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)

Introduction to System Dynamics (ME 373)	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)

Introduction to Mechanical Design (ME 395)	Teaching Assistant, University of Washington
Taught design process and methodology, decision making, optimization techniques, project planning, eng	

ineering 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** Bothell,
    - Young Beum Cho (EE, STEM, Undergraduate study), Height adjustable smart wheelchair (2credit/fall'18, 2credit/win'19, 2credit/spr'19, 2credit/fall'19, 2creidt/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
    - 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: 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 20th World Petroleum Conference and Exhibition,* National Convention Center, December 4th -8th, 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 Almerekhi 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

- **NSF Graduate Research Fellowships Program (GRFP) 2020 Reviewer**
- 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]
- **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 - present
- ASEE member, 2016 - present
- Korean-American Engineers and Scientists Association (KSEA) member, 2005 – present

UNIVERSITY AND COMMUNITY SERVICE/ACTIVITIES

University of Washington, Bothell

- 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 **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
- 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
- **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
- **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 12th, 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), 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 – 30th, 2011

Others

- 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),** 48th term (2019 – 2020).
- **Chapter President Chair (CPC)**, **Korean-American Engineers and Scientists Association (KSEA),** 46th and 47th terms (2017 – 2019).
- Committee member, Contest Committee, **Korean-American Engineers and Scientists Association (KSEA),** 46th term (2017 – 2018).
- **Chapter president**, **Korean-American Engineers and Scientists Association (KSEA), Seattle Chapter,** 44 (acting), 45, 46, and 47th 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

- 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
- Languages: Korean (Fluent), Japanese (Conversant and reading)
- 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

REARCH COLLABORATORS

- **Eric Seibel**, Research Professor,
  Human Photonics Lab, Mechanical Engineering,
  University of Washington, WA, USA

- **Myong-Kee Jeong,** Professor
  Department of Industrial & Systems Engineering (ISE)
  Rutgers, The State University of New Jersey, NJ, USA

- **Blake Hannaford**, Professor,
  Biorobotics Lab, Electrical Engineering,
  University of Washington, WA, USA

- **John B. Troy**, Professor, Chair,
  Biomedical Engineering,
  Northwestern University, IL, USA

- **Hyouk Ryeol Choi**, Professor, Chair
  Intelligent Robotics & Mechatronic System Laboratory,
  Department of Mechanical Engineering,
  Sungkyunkwan University, Korea

- **Yoon Sang Kim**, Professor,
  School of Computer Science and Engineering,
  Korea University of Technology and Education, Korea

- **Per G. Reinhall**, Professor, Chair,
  Mechanical Engineering,
  University of Washington, WA, USA

- **Thomas S. Lendvay**, M.D.,
  Department of Urology, University of Washington, School of Medicine and
  Seattle Children's Hospital, Seattle, WA, USA

- **Sangtae Park**, M.D.,
  Section of Urology, Department of Surgery,
  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., Associate 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, Assistant Professor,
  Department of Computer Science,
  University of Bath, UK

- **Sanggyeun Ahn,** PhD, Associate Professor
  Industrial Design Program, the School of Art
  University of Washington, WA, USA

- **Julien Abi Nahed**, PhD, Lead R&D Executive
  Qatar Robotic Surgery Center (QRSC)
  Qatar Science and Technology Park (QSTP), Qatar

- The end -