Jaerock Kwon, Ph.D.

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Affiliation

- Assistant Professor (Jan 2020 – Present) Electrical and Computer Engineering at the University of Michigan-Dearborn
- Associate Professor (Tenured), (May 2016 – Dec 2019) Electrical and Computer Engineering at Kettering University
- Assistant Professor (May 2010 – May 2016) Electrical and Computer Engineering at Kettering University
- Visiting Assistant Professor (July 2009 – May 2010) Electrical and Computer Engineering at Kettering University

Education

- Ph.D.: Department of Computer Science and Engineering, Texas A&M University, College Station, TX (August 2009)
  - Brain Network Lab / Neural Intelligence Lab
  - Dissertation Title: Acquisition and Mining of the Whole Mouse Brain Microstructure
  - Research Advisor: Dr. Yoonsuck Choe
- M.S.: Department of Electronic Communication Engineering, Hanyang University, Seoul, Korea (February 1994)
  - Artificial Intelligence Lab / Natural Language Processing Team
  - Thesis Title: The Design and Implementation of a Korean Sentence Generator using Feature Structures.
  - Research Advisor: Dr. Byeongwook Choi
- B.S.: Department of Electronic Communication Engineering, Hanyang University, Seoul, Korea (February 1992)

Research Interest

- Artificial Intelligence, machine deep learning, neural network, and neuroevolution
- Autonomous vehicles, neurorobotics, and mobile robotics
- Human gait analysis in 3D using 2D images
- Biologically motivated sensor and motor integration
- Microscopy instrumentation, automation, computational neuroanatomy, and neuroinformatics: Reconstruction, visualization, statistical analysis, acquisition and analysis of large biological data sets
- Computational Neuroscience

Grants

- MRI: Acquisition of Autonomous Plug-In Hybrid Vehicle Platform for Multidisciplinary Research and Education at the University of Michigan-Dearborn, National Science Foundation, $244,610.00, (PI), 9/1/2022 – 8/31/2025
- AI System Security Detection Monitoring Research, Ford Motor Company, $199,731.00, (co-PI), 4/1/2022 – 3/31/2024

- Development of Markerless 3D Human Motion Capture Framework from 2D Videos Using Deep Learning, ADVANCE Grant Program, Michigan State Economic Development Corporation, $10,000.00, (PI), 2022
- Detection and tracking of vehicles using Lidar point clouds for autonomous lane-changing system, Hyundai MOBIS Technical Center North America, $50,000.00, (co-PI), 5/31/2021 – 11/30/2021
- Driver Style Transfer for Autonomous Driving, Summer Undergraduate Research Experience (SURE) Program, 2021
- Cooperative Perception and Navigation for Multiple Vehicles Using Deep Neural Network, Korea-US International Joint Research Project sponsored by Institute for Information and Communications Technology Promotion (IITP), Korea, $41,617.00, (PI), June 2020 – May 2021
- Development of Autonomous Vehicle Research Platform using Deep Learning and Robot Operating System, Korea-US International Joint Research Project sponsored by Institute for Information and Communications Technology Promotion (IITP), Korea, $21,027.00, (PI), Jan 2020 – June 2020
- Markerless 3D Human Motion Inference Framework from 2D Videos using Deep Learning, Research Initiation & Development Grant by University of Michigan-Dearborn, $15,000.00, (PI), May 2020 – April 2022
- Development of Autonomous Vehicle Research Platform using Deep Learning and Robot Operating System, Korea-US International Joint Research Project sponsored by Institute for Information and Communications Technology Promotion (IITP), Korea, (PI), July 2019 – Dec 2019
- 3D Modeling of Human Motion from 2D Video Images Using AI-based Markerless Inference Framework, Center for Scholarly and Creative Excellence (CSCE) Collaborative Research Grant from Grand Valley State University, (PI), April 2019
- Development of Experimental Setup for Evaluating Vehicular Communication System (V2X), Faculty Research Fellowship, Kettering University, (PI), 2018.
- MRI: Acquisition of a High Performance Computing Cluster for Multi-Disciplinary Research & Education at a Primarily Undergraduate Institution, National Science Foundation, Award Number: OAC-1725938, (Senior Personnel), 2018 – 2020
- Development of Low-Cost Autonomous Vehicle Experimental Platform, Provost's Research Matching Fund, (PI), 2017
- A Touch-Enabled Virtual Room for Scientific Data Exploration, Kettering University, Faculty Research Fellowship, (PI), 2015.
- Development of Software Tools for Driver Assistance Systems, Magna Electronics, (PI), 2015
- Development of High-Throughput ad High-Resolution Three-Dimensional Tissue Scanner with Internet-Connected 3D Virtual Microscope for Large-Scale Automated Histology (National Science Foundation Award No. ECCS-1337983, PI: Kwon), (PI), Sep 1, 2013 – Aug 31, 2017.
- Computer Engineering Summer Day Camp funded by GM Foundation (2013)
- Computer Engineering Day Camp (The Donald Lee Smith Fund through the Community Foundation of Greater Flint, 2013-2015).
- Development of LED system lighting engine module with compact sized data communication modules and driver IC/Processor control parts based on multi-sensor (supported by the MKE/Ministry of Knowledge Economy, Korea supervised by the KEIT/Korea Evaluation Institute of Industrial Technology; Subcontract, 2012-2015).
- Travel Grant for IEEE International Joint Conference on Neural Networks, 2007.

Awards
- Outstanding Researcher Award, 2016 in recognition of significant contributions in the areas of Computational Neuroscience and Neurobotics.
- Kettering University Innovation Fellow, 2013
- Oswald International Faculty Fellowships for 2010-2011.
- SK Employee Award, MPR/S division, An Excellent Employee, SK Teletech, December 2001.
- Graduate fellowship from LG Electronics Co., Ltd. (Two-year full-tuition), January 1992 – December 1993.
- Undergraduate fellowship from LG Electronics Co., Ltd. (Two-year full-tuition), January 1990 – December 1991
- Academic Merit Scholarship, August 1988.

Experience

Academia
- Director (2020 – Present)
  - Bio-Inspired Machine Intelligent Laboratory, Department of Electrical and Computer Engineering, University of Michigan-Dearborn
- Director (2013 – 2019)
  - Brain Inspired Intelligent Systems Laboratory, Department of Electrical and Computer Engineering, Kettering University
- Co-Director (2010 – Present)
  - Mobile Intelligent Systems Laboratory, Department of Electrical and Computer Engineering, Kettering University
- Research Assistant (May 2008 – May 2009)
  - International Student Services, Texas A&M University, College Station, TX
    - HTML, ASP, Javascript, Access, MS-SQL Database
- Research Assistant (September 2005 – May 2008)
  - Brain Network Lab, Texas A&M University, College Station, TX
    - Conducted research on cognitive models and algorithms regarding Neural networks, Genetic algorithms, and Artificial intelligence
    - Developed an automatic data acquisition system, data server, data transmission, image capture, and stage controller system Knife-Edge Scanning Microscope (KESM)
    - Developed an automatic image registration system for large data sets, image processing for removing noise and normalizing uneven light intensity using ITK (Insight Segmentation and Registration Toolkit).
    - Developed a volumetric data browser for large data sets using VTK (Visualization Tool Kit)
- Research Assistant (January 2005 – May 2005)
  - Engineering Technology and Industrial Distribution, Texas A&M University, College Station, TX
    - Developed a remote control and automation system using Web-based interface.

Industry
- Advisory Professor, Clova team at NAVER, April 2018 - September 2018

- ○ Conducted research on view-invariant person re-identification using human gaits
- Senior Software Engineer, July 2002 – June 2004
  - ○ Qualcomm Inc. Korea (Qualcomm Internet Service):
  - ○ Support engineer for the BREW and OEM developer
    - Integrated BREWChat (Push To Talk solution) for an OEM
    - Consulted for BREW application developers
    - Consulted for OEM engineers to port BREW both in person and through email
    - Wrote BREW training materials for developers.
    - Gave lectures on BREW SDK, and wrote FAQ, troubleshooting and knowledge base.
    - Skills: C/C++, BREW, DMSS, REX, ARM C/C++, Trace32
- Senior Software Engineer, January 2000 – June 2002
  - ○ SK Teletech (Research and Development Center, now Pantech):
    - Developed a new embedded application platform
    - Recipient of MPR/S Award (Excellent Employee, 2001)
    - Developed an embedded application platform for mobile devices (EQUS) (Event driven system, common controls, and application manager)
    - Designed for multi-platforms, and developed an emulator for Windows OS
    - Developed user interfaces for CDMA handsets
    - Developed the first color LCD handset (SKY IM-3100) in the Korean market with a graphical user interface
    - User interface development for commercial CDMA IS-95A/B/C, CDMA 2000 cellular phones; SK Teletech models: (Camera, color LCD, multi-poly melody, CDMA 2000 1X, CDMA 2000, EVDO, GPS)
    - Skills: C/C++, BREW, DMSS, REX, ARM C/C++, Trace32, Visual C/C++, MFC, Win32
- Associate Research Engineer, January 1999 – December 1999
  - ○ LG Electronics (Digital TV Research Center):
  - ○ Developed the digital TV set-top box data browser
    - Embedded System Software for Digital TV Set-top Box on RTOS (pSOS) n Enhanced the layout engine to support HTML 4.0
    - Content Parser and Layout Engine of ATVEF Data Broadcast
    - HTML 4.0 parser for ATVEF data broadcast content format
    - Skills: C/C++, pSOS, ARM C/C++, Device Mosaic 3.1, HTML, ECMA Script, CSS, DOM
- Associate Research Engineer, January 1996 – December 1998
  - ○ LG Electronics (Media Communication Research Center):
  - ○ Developed telephony systems for LG personal computers
    - Developed the telephony module which supports the answering machine, voice mail, and fax for LG multimedia PC (SoftHome 3.0)
    - Developed PC Agent System (Windows shell for novice users) (SoftHome 98)
    - Skills: – C/C++, Mpact Media Processor, Windows 98, Visual C/C++, MFC, TAPI (Telephony API). Hayes AT command, Rockwell AT+V command, Mwave Telephony API
- Assistant Research Engineer, January 1994 – December 1995
  - ○ LG Electronics (Information Technology Research Center):
  - ○ Developed device diagnostic applications for mass manufacturing

- ■ Device diagnostic applications (LG 3DO CD-based game console) Embedded splash/attractive screen (LG 3DO CD-based game console)
- ■ Skills: C/C++, pSOS, ARM C/C++, Power Mac, 3DO Graphic, 3DO Audio

Patent
- Registered:
  - ○ Data information display method of data broadcasting receiver and apparatus thereof, US Patent No: 7100117, August 29, 2006
  - ○ Method for service offering using formalized user information, H04L 12/58 (January 2006), 1006520300000 (November 23, 2006)
- Registered but expired:
  - ○ Apparatus for defining TV/DATA broadcasting objects by user, H04N 5/445 (January 2006), 1006936480000 (March 5, 2007)
  - ○ Display method of pop-up tree type electronic program guide, H04N 5/50 (January 2006) 1006414370000 (October 25, 2006)
  - ○ Two way digital television system, H04N 7/173 (January 2006), 1006975130000 (March 13, 2007)
  - ○ Method for detecting channel in digital TV, H04N 7/12 (January 2006) 1006409170000 (October 25, 2006)

Publications

Books
- Kwon, Jaerock. Windows 95 Communication Programming (Korean), ISBN 10 – 8983540079, ISBN 13 – 9788983540072, Hancom Press, 529 pages, June 1997
- Kwon, Jaerock. The Korean Alphabet Input and Output System (Korean), ISBN 10 – 8931542593, ISBN 13 – 9788931542592, Seongandang Press, 1996
- Kwon, J., Chung, S., and Lee, B. Visual Basic 6, from the GROUND UP (translated English to Korean edition), ISBN 10 – 8988723015, ISBN 13 – 9788988723012, Gary Cornell, McGraw-Hill1998, 1095 pages.

Thesis and Dissertation
- Jesudara Omidokun, "Design and Implementation of an Autonomous Driving System with a Deep Learning Approach on a Scaled Vehicle Platform," Master's Thesis, University of Michigan-Dearborn, 2022
- Ahmed Abdelhamed, Software-In-the-Loop Sensor Fusion Model Using LIDAR and Camera for Detecting and Classifying Obstacles, Kettering University, 2020
- Akanksha Ashwini, IEROM Image Processing Pipeline and 3D Real-Time Interactive Visualization Methods for Teravoxel Volumes, Kettering University, 2020
- Ninad Doshi, Thesis: An Approach to Integrate LSTM with CNN and Comparative Analysis of Different Behavioral Cloning Approaches for Autonomous Vehicles, Kettering University, 2019
- Nikhil Prabhu, Traffic Sign Detection in Gazebo Simulation Environment Using YOLOv3, Kettering University, 2019
- Mohamed Fasil Syed Ahamed, Design and Evaluation of Software-In-the-Loop Modeling and Simulation Framework for Autonomous Vehicles, Kettering University, 2019
- Li Dang, A Study of Autonomous Driving with ROS, Kettering University, 2017

- Shruthi Raghavan, Acquisition and Analysis of Mouse Brain Vasculature, Kettering University, 2016
- Joingil Lim, Design and Implementation of a Network Robotics Framework Using a Smartphone Based Robotics Platform, Kettering University, 2015
- Kwon, J., Acquisition and Mining of the Whole Mouse Brain Microstructure, Ph.D. dissertation, Department of Computer Science, Texas A&M University, College Station, TX, 2009
- Kwon, J., Design and Implementation of a Korean Language Generator using Feature Structures, Master's thesis, Electronic Communication Engineering Department, Hanyang University, Seoul, Korea, 1994

Journal Articles

- Donghyun Kim, Aws Khalil, Haewoon Nam, Jaerock Kwon, "OPEMI: Online Performance Evaluation Metrics Index for Deep Learning-Based Autonomous Vehicles," IEEE Access, 2023
- Subhadip Ghosh, Aydin Zaboli, Junho Hong, Jaerock Kwon, "An Integrated Approach of Threat Analysis for Autonomous Vehicles Perception System, " IEEE Access, 2023
- Jaerock Kwon, Aws Khalil, Donghyun Kim, Haewoon Nam, "Incremental End-to-End Learning for Lateral Control in Autonomous Driving," IEEE Access, 2022.
- Junho Hong, Yong-Hwa Kim, Hong Nhung-Nguyen, Hyojong Lee, Jaerock Kwon, "Deep-Learning Based Fault Events Analysis in Power Systems," MDPI Energies, Special Issue "Artificial Intelligence for Power Electronics and Energy Systems Applications," 2022
- Gyouho Cho, Mengqi Wang, Youngki Kim, Jaerock Kwon, Wencong Su, "A Physics-Informed Machine Learning Approach for Estimating Lithium-Ion Battery Temperature," IEEE Access, 2022.
- Aws Khalil, Ahmed Abdelhamed, Girma Tewolde, Jaerock Kwon, "Ridon Vehicle: Drive-by-Wire System for Scaled Vehicle Platform and Its Application on Behavior Cloning," MDPI Energies, Special Issue "Autonomous Vehicles Perception and Control," 2021.
- Young Seek Cho, Kyungjoon Choi, Jaerock Kwon, "Self-sustainable wireless sensor network for low temperature application," Microwave and Optical Technology Letters, 2021
- Jaerock Kwon, Jehyung Lee, Yunju Lee, "Comparative Study of Markerless Vision-based Gait Analyses for Person Re-identification," MDPI Sensors, 2021
- Dajeong Park, Seok-Ju Lee, Jaerock Kwon, Seyeong Choi, Localization of Mobile Robot Based on Artificial Landmark, The Journal of Korean Institute of Communications and Information Sciences 45(12):2150-2153 DOI: 10.7840/kics.2020.45.12.2150, December 2020
- Jongil Lim, Girma Tewolde, Jaerock Kwon, Seyeong Choi, "Design and Implementation of a Network Robotic Framework Using a Smartphone-Based Platform," IEEE Access, 2019
- Jongil Lim, SeokJu Lee, Girma Tewolde, Jaerock Kwon, Indoor Localization and Navigation for a Mobile Robot Equipped with Rotating Ultrasonic Sensors Using a Smartphone as the Robot's Brain, International Journal of Handheld Computing Research (IJHCR) Volume 7, Issue 1, January – March 2016
- Seok-Ju Lee, Girma Tewolde, Jongil Lim, Jaerock Kwon, Vision Based Localization for Multiple Mobile Robots Using Low-cost Vision Sensor, International Journal of Handheld Computing Research (IJHCR) Volume 7, Issue 1, January – March 2016
- Young Seek Cho, Jaerock Kwon, and Seyeong Choi, "Design and Implementation of Wireless Sensor Network for Freeze Dryer," Journal of information and communication convergence engineering, vol. 13, no. 1, pp.21-26, March 2015.

- Matthew Clark, Jongil Lim, Girma Tewolde, Jaerock Kwon, Affordable Remote Health Monitoring System for the Elderly Using Smart Mobile Device, Sensors & Transducers Journal and Magazine, pp.77-83 (ISSN: 2306-8515, e-ISSN 1726-5479) Vol.184, Issue 1, January 2015
- Jaewook Yoo, Jaerock Kwon, and Yoonsuck Choe, Predictable Internal Brain Dynamics in EEG and Its Relation to Conscious States, Frontiers in Neurorobotics, 2014
- Young Seek Cho, Jaerock Kwon, and Hwan-Yong Kim, Design and Implementation of LED Dimming System with Intelligent Sensor Module, Journal of information and communication convergence engineering, Vol 11 (4), 2013.
- Yoonsuck Choe, Jaerock Kwon and Ji Ryang Chung, Time, Consciousness, and Mind Uploading, International Journal of Machine Consciousness (IJMC), 2012.
- David Mayerich, Jaerock Kwon, Chul Sung, Louise Abbott, John Keyser, and Yoonsuck Choe, Fast macro-scale transmission imaging of microvascular networks using KESM, Biomedical Optics Express, Vol. 2, Issue 10, pp. 2888-2896 (2011)
- J. R. Chung, C. Sung, D. Mayerich, J. Kwon, D. E. Miller, T. Huffman, L. C. Abbott, J. Keyser, and Y. Choe. Multiscale exploration of mouse brain microstructures using the knife-edge scanning microscope brain atlas. Frontiers in Neuroinformatics, 2011.
- Yoonsuck Choe, David Mayerich, Jaerock Kwon, Daniel E. Miller, Chul Sung, Ji Ryang Chung, Todd Huffman, John Keyser, and Louise C. Abbott. Specimen Preparation, Imaging, and Analysis Protocols for Knife-Edge Scanning Microscopy. Journal of Visualized Experiments, 2011.
- Kwon, J. and Choe, Y., Facilitating Neural Dynamics for Delay Compensation: A Road to Predictive Neural Dynamics?, IEEE Transactions on Neural Networks, April 2009

Conference Papers

- Byung Chan Choi, Jaerock Kwon, Haewoon Nam, "Image Prediction for Lane Following Assist using Convolutional Neural Network-based U-Net," The 4th International Conference on Artificial Intelligence in Information and Communication (ICAIIC 2022), Feb 21-24, 2022
- Donghyun Kim, Jaerock Kwon, Haewoon Nam, End-to-End Learning-based Self-Driving Control Imitating Human Driving, The 12th International Conference on ICT Convergence (ICTC 2021), October 20-22, 2021 / Ramada Plaza Hotel, Jeju Island, Korea
- Gyouho Cho, Youngki Kim, Jaerock Kwon, Mengqi Wang, Wencong Su, Impact of Data Sampling Methods on the Performance of Data-driven Parameter Identification for Lithium ion Batteries, 2021 Modeling, Estimation and Control Conference, (MECC 2021)
- Ahmed Abdelhamed, Girma Tewolde, and Jaerock Kwon, Simulation Framework for Development and Testing of Autonomous Vehicles, International IOT, Electronics and Mechatronics Conference, Vancouver, Canada, Sep 2020
- Nikhil Prabhu, Sewoong Min, Haewoon Nam, Girma Tewolde, and Jaerock Kwon, Integrated Framework of Autonomous Vehicle with Traffic Sign Recognition in Simulation Environment, IEEE International Conference on Electro/Information Technology, Naperville, IL, USA, July 2020
- Shobit Sharma, Girma Tewolde, and Jaerock Kwon, Lateral and Longitudinal Motion Control of Autonomous Vehicles using Deep Learning, 2019 IEEE International Conference on Electro/Information Technology, Brookings, South Dakota, USA, May 2019
- Shruthi Raghavan and Jaerock Kwon, Tracing Tubular Structures from Teravoxel-Sized Microscope Images, the 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'18), Honolulu, HI, USA, July 17-21, 2018.

- Akanksha Ashwini and Jaerock Kwon, Image Processing Pipeline for Web-Based Real-Time 3D Visualization of Teravoxel Volumes, The Third International Conference on Data Mining and Big Data (DMBD'2018), Shanghai, China, June 2018.
- Shobit Sharma, Girma Tewolde, and Jaerock Kwon, Behavioral Cloning for Lateral Motion Control of Autonomous Vehicles using Deep Learning, The 17th Annual IEEE I International Electro/Information Technology Conference, May 2018, Rochester, MI, USA
- Mohamed Fasil Syed Ahamed, Girma Tewolde, and Jaerock Kwon, Software-in-the-loop Modeling and Simulation Framework for Autonomous Vehicles, The 17th Annual IEEE I International Electro/Information Technology Conference, May 2018, Rochester, MI, USA
- Taajwar Bey, Girma Tewolde, and Jaerock Kwon, Short Survey of Vehicular Communication Technology, The 17th Annual IEEE I International Electro/Information Technology Conference, May 2018, Rochester, MI, USA
- Jaren Golenbiewski, Girma S. Tewolde, Jaerock Kwon, Survey of Indoor Positioning Technologies for prototyping at Kettering University, The 17th Annual IEEE I International Electro/Information Technology Conference, May 2018, Rochester, MI, USA
- Li Dang, Nishanth Sriramoju, Girma Tewolde, Xiaoyuan Zhang, Designing a cost-effective Autonomous Vehicle Control System Kit (AVCS Kit), 2017 IEEE AFRICON, September 2017
- Li Dang, Girma Tewolde, Xiaoyuan Zhang, Jaerock Kwon, Reduced resolution lane detection algorithm, 2017 IEEE AFRICON, September 2017
- Seokju Lee, Girma Tewolde, Jongil Lim, Jaerock Kwon, 2D SLAM Solution for Low-Cost Mobile Robot based on Embedded Computer Board, The 2017 World Congress on Advances in Structural Engineering and Mechanics. KINTEX, Ilsan(Seoul), Korea, August 2017
- Li Dang, Jaerock Kwon, Design of a New Cost-Effective Head for a Low-Cost Humanoid Robot, The 7th IEEE Annual Ubiquitous Computing, Electronics & Mobile Communication Conference, New York City, USA, October 2016
- Shruthi Raghavan, Matthew Goodman, Todd Huffman, Cody Daniel, Corey Monteith, and Jaerock Kwon. Internet-Connected High-Throughput and High-Resolution Three-Dimensional Tissue Scanner to Enable Large-Scale Automated Histology. 2016 IEEE International Conference on Imaging Systems and Techniques (IST), Crete, Greece, October 2016.
- Daniel E. Miller, Raj S. Shah, Wencong Zhang, Jaewook Yoo, Jaerock Kwon, David Mayerich, John Keyser, Louise C. Abbott, and Yoonsuck Choe. Fast submicrometer-scale imaging of whole zebrafish using the knife-edge scanning microscope. In Proceedings of the 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 2016.
- Shruthi Raghavan, Jaerock Kwon. Fully Automated Image Preprocessing for Feature Extraction from Knife-Edge Scanning Microscopy Image Stacks, 9th International Joint Conference on Biomedical Engineering Systems and Technologies, Rome, Italy, February 2016.
- Li Dang, Xiaoyuan Zhang, Girma Tewolde, Jaercok Kwon. Reduced Resolution Lane Detection Algorithm, ICRACES 2016 : 18th International Conference on Robotics, Automation, Control and Embedded Systems, Dubai, UAE. September 2016.
- Phanindra Amaradi, Nishanth Sriramoju, Li Dang, Girma Tewolde, Jaerock Kwon. Lane Following and Obstacle Detection Techniques in Autonomous Driving Vehicles, 2016 IEEE INTERNATIONAL CONFERENCE on ELECTRO/INFORMATION TECHNOLOGY, Grand Forks, North Dakota, USA 2016.
- Girma Tewolde and Jaerock Kwon, Arduinos, Mobile Robots, and Smartphones for a Computer Engineering Summer Camp, Proceedings of the 2015 ASEE North Central Section Conference

- Seok-Ju Lee, Girma Tewolde, Jongil Lim, Jaerock Kwon, QR-code based Localization for Indoor Mobile Robot with Validation using a 3D Optical Tracking Instrument, 2015 IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Busan, Korea.
- Jongil Lim, SeokJu Lee, Girma Tewolde Jaerock Kwon, Indoor Localization and Navigation for a Mobile Robot Equipped with Rotating Ultrasonic Sensors Using a Smartphone as the Robot's Brain, 2015 IEEE International Conference on Electro/Information Technology, DeKalb, IL, USA
- Seok-Ju Lee, Girma Tewolde, Jongil Lim, Jaerock Kwon, Vision Based Localization for Multiple Mobile Robots Using Low-cost Vision Sensor, 2015 IEEE International Conference on Electro/Information Technology, DeKalb, IL, USA
- Young Seek Cho, Jaerock Kwon, Seyeong Choi, and Dae-Hee Park, Development of Smart LED Lighting System Using Multi–Sensor Module and Bluetooth Low Energy Technology, IEEE International Conference on Sensing, Communications and Networking (SECON), 2014
- Jongil Lim, SeokJu Lee, Girma Tewolde, and Jaerock Kwon, Ultrasonic-Sensor Deployment Strategies and Use of Smartphone Sensors for Mobile Robot Navigation in Indoor Environment, 2014 IEEE International Conference on Electro/Information Technology
- SeokJu Lee, Jongil Lim, Jaerock Kwon, and Girma Tewolde, Autonomous Tour Guide Robot by using QR code Recognition in Indoor Environment, 2014 IEEE International Conference on Electro/Information Technology
- Girma Tewolde and Jaerock Kwon, Robots and Smartphones for Attracting Students to Engineering Education, 2014 Zone 1 Conference of the American Society for Engineering Education, Bridgeport, Connecticut, 2014.
- SeokJu Lee, Girma Tewolde, and Jaerock Kwon, Design and Implementation of Vehicle Tracking System Using GPS/GSM/GPRS Technology and Smartphone Application, IEEE World Forum on Internet of Things WF-IoT 2014.
- Jaerock Kwon, Enhanced Image Processing Pipeline and Parallel Generation Of Multiscale Tiles for Web-Based 3D Rendering of Whole Mouse Brain Vascular Networks, International Conference on Pattern Recognition Applications and Methods (ICPRAM) 2014.
- Yoonsuck Choe, Jaerock Kwon, David Mayerich, and Louise C. Abbott. Connectome, mouse. In Dieter Jaeger and Ranu Jung, editors, Encyclopedia of Computational Neuroscience. Springer, Berlin, 1st edition, 2014. In press.
- Y.C. Kim, W.S Yang, J. Kwon, Y.S. Choe, S. Choi and D.H. Park, Development of LED Lighting System using Bluetooth Wireless Communication, The Korean Institute of Electrical and Electronic Material Engineers General Meeting & Annual Autumn Conference, 2012.
- Yoonsuck Choe, David Mayerich, Jaerock Kwon, Daniel Miller, Ji Ryang Chung, Chul Sung, John Keyser, and Louise Abbott , Knife-Edge Scanning Microscopy for Connectomics Research, IJCNN 2011 – International Joint Conference on Neural Networks, San Jose, California, 2011 (In press).
- G. Tewolde and J. Kwon, Efficient WiFi-based Indoor Localization using Particle Swarm Optimization, International Conference on Swarm Intelligence, Chongqing, China, 2011.
- Kwon, J., David, M., and Choe, Y., Automated Cropping and Enhanced Noise Removal for Knife-Edge Scanning Microscopy, IEEE International Symposium on Biomedical Imaging. Chicago, Illinois, 2011.
- David, M., Kwon, J., Panchal A., Keyser, J., and Choe, Y., Fast Cell Detection in High-throughput Imagery Using GPU-Accelerated machine Learning, IEEE International Symposium on Biomedical Imaging. Chicago, Illinois, 2011.

- Jaerock Kwon and Yoonsuck Choe. Predictive internal neural dynamics for delay compensation. In Second World Congress on Nature and Biologically Inspired Computing (NaBIC2010), 2010.
- Kwon, J. and Choe, Y., Facilitating Neural Dynamics for Delay Compensation: A Road to Predictive Neural Dynamics?, IEEE Transactions on Neural Networks, April 2009
- Chung, J., Kwon, J., and Choe, Y., Evolution of Recollection and Prediction in Neural Networks., International Joint Conference on Neural Networks, 2009
- Kwon, J., and Choe, Y., Internal State Predictability as an Evolutionary Precursor of Self-Awareness and Agency. In Proceedings of the Seventh International Conference on Development and Learning, pages 109-114. IEEE, 2008
- David, M., Kwon, J., Choe, Y., and Keyser, J., Constructing High-Resolution Microvascular Models., 3rd International Workshop on Microscopic Image Analysis with Applications in Biology, 2008
- Kwon, J. and David, M., Lateral Sectioning for Knife-Edge Scanning Microscopy., IEEE International Symposium on Biomedical Imaging., Paris, France, 2008
- Kwon, J. and Choe, Y., Enhanced Facilitatory Neuronal Dynamics for Delay Compensation., In Proceedings of the International Joint Conference on Neural Networks., Piscataway, NJ, 2007. IEEE Press. (Awardee of travel grants for IEEE IJCNN 2007 conference)
- Kwon, J., Kang, S., Kim, Y., Woo, Y., Kim, H., and Choi, B., The Design and Implementation of Korean Generator Using Feature Structure., In Proceedings of the Institute of Electronics Engineers of Korea., Vol. 16, 2. p979-983, November 1993

Book Chapters
- Ji Ryang Chung, Jaerock Kwon, Timothy A. Mann, and Yoonsuck Choe. Evolution of time in neural networks: From the present to the past, and forward to the future. In A. Ravishankar Rao and Guillermo A. Cecchi, editors, The Relevance of the Time Domain to Neural Network Models. Springer, Berlin, 2011. In press.
- Y. Choe, L.C. Abbott, D. Han, P. Huang, J. Keyser, J. Kwon, D. Mayerich, Z. Melek, B.H. McCormick, Knife-Edge Scanning Microscopy: High-throughput Imaging and Analysis of Massive Volumes of Biological Microstructures, In R. Rao and G. Cecchi, editors, High-throughput Image Reconstruction and Analysis: Intelligent Microscopy Applications, Series on Bioinformatics and Biomedical Imaging, Artech House Publishers, 2008.

Abstracts
- Byung Chan Choi, Haewoon Nam, and Jaerock Kwon. "Analysis of Features from Convolutional Neural Network-based Encoder for Image Retrieval-based Vehicle Localization." Conference on Artificial Intelligence in Smart Cities 2021, Virtual
- Jaerock Kwon and Mohamed Houssem Fehri. "Sensorimotor Association Learning and Internal Simulation Network (SALIS-Net) for Autonomous Driving." Conference on Artificial Intelligence in Smart Cities 2021, Virtual
- Mohamed Houssem Fehri and Jaerock Kwon. "Sensory Motor Integration Learning for Autonomous Driving." US-Korea Conference (UKC) 2020 Virtual
- Mohamed Houssem Fehri and Jaerock Kwon, Sensory Motor Integration Learning for Autonomous Driving, Dearborn AI Symposium, 2020
- Jaerock Kwon, and Rohan Pradeepkumar Nair, Autonomous Vehicle Research Platform, Dearborn AI Symposium, 2020
- Jaerock Kwon, and Sanjyot Thete, Compensation Latency in Autonomous Driving, Dearborn AI Symposium, 2020

- Li Dang, Nishanth Sriramoju, Amaradi Phanindra, Xiaoyuan Zhang, Girma Tewolde, Jaerock Kwon. Enhanced Lane and Obstacle Detection Technique for Intelligent Vehicles. ASEE-North Central Section, 2016.
- A. Ashwini, S. Raghavan, Y. Choe, D. Mayerich, T. Huffman, M. Goodman, C. Daniel, J. Kwon. Web-based real-time 3D visualization framework for teravoxel volumes. Society for Neuroscience Annual Meeting, San Diego, California 2016.
- Shruthi Raghavan, Jaerock Kwon. DIVIDE, CONQUER, AND COMBINE ALGORITHM TO TRACE COMPLEX TUBULAR STRUCTURES FROM TERAVOXEL-SIZED MICROSCOPE IMAGE STACKS, The 2016 International Symposium on Biomedical Imaging. Prague, The Czech Republic, April 2016.
- S. RAGHAVAN, Y. CHOE, D. MAYERICH, T. HUFFMAN, M. GOODMAN, C. DANIEL, J. KWON. Internet-enabled robotic microscope powered by knife-edge scanning microscopy, Society for Neuroscience Annual Meeting, Chicago, Illinois, October 2015.
- Mr. Woo Seok Yang, Mr. Hye Myeong Kim, Prof. Young Seek Cho, Prof. Seyoung Choi, Prof. Jaerock Kwon, Prof. Dae Hee Park. Development of Intelligent LED Lighting System with Bluetooth Wireless Interface. International Conference on Advanced Electromaterials, ICAE, Jeju, Korea, Nov 2013.
- W. S. Yang, H. M. Kim, J. Kwon, Y.S. Choe, S. Choi, D.H. Park, Implementation of LED Dimming System using Ultrasonic sensor and MCU, The Korean Institute of Electrical and Electronic Material Engineers General Meeting & Annual Summer Conference, 2013.
- H.M. Kim, W.S Yang, J. Kwon, Y.S. Choe, S. Choi, D.H. Park, Control of LED Lighting System using Bluetooth Wireless Communication, The Korean Institute of Electrical and Electronic Material Engineers General Meeting & Annual Summer Conference, 2013.
- C. SUNG, D. MAYERICH, J. KWON, D. E. MILLER, L. C. ABBOTT, J. KEYSER, T. HUFFMAN, *Y. CHOE, Web-based knife-edge scanning microscope brain atlas in vector-graphics for enhanced performance, Society for Neuroscience Annual Meeting, New Orleans, Louisiana, October 2012.
- Yoonsuck Choe, Louise C. Abbott, Giovanna Ponte, John Keyser, Jaerock Kwon, David Mayerich, Daniel Miller, Donghyeop Han, Anna Maria Grimaldi, Graziano Fiorito, David B. Edelman, and Jeffrey L. McKinstry. Charting out the octopus connectome at submicron resolution using the knife-edge scanning microscope. BMC Neuroscience, 11(Suppl 1):P136, 2010. Nineteenth Annual Computational Neuroscience Meeting: CNS*2010.
- Y. CHOE, L. C. ABBOTT, J. KEYSER, D. E. MILLER, D. HAN, H.-F. YANG, J. R. CHUNG, C. SUNG, D. MAYERICH, J. KWON, K. MICHEVA, S. J. SMITH, Multiscale imaging, analysis, and integration of mouse brain networks. Society for Neuroscience Annual Meeting, San Diego, CA, October 2010
- J. KWON, D. MAYERICH, Y. CHOE, Automated cropping and artifact removal for Knife-Edge Scanning Microscopy, Society for Neuroscience Annual Meeting, San Diego, CA, October 2010
- Yoonsuck Choe, Anna Maria Grimaldi, Donghyeop Han, Daniel Miller, David Mayerich, Jaerock Kwon, John Keyser, Giovanna Ponte, Louise Abbott, Graziano Fiorito, Charting out the Octopus Connectome at Submicron Resolution Using the Knife-Edge Scanning Microscope.CNS*2010, San Antonio, TX, July 2010
- Yoonsuck Choe and Jaerock Kwon, Open issues in high-fidelity simulation of the connectome. CNS*2010 Workshop on High-throughput 3D microscopy and high-performance computing for multi-scale modeling and simulation of large-scale neuronal circuits, San Antonio, TX, July 2010

- Louise C. Abbott, David Mayerich, Jaerock Kwon, and Yoonsuck Choe High-throughput imaging of whole mouse brain using the Knife-Edge Scanning Microscope. CNS*2010 Workshop on High-throughput 3D microscopy and high-performance computing for multi-scale modeling and simulation of large-scale neuronal circuits, San Antonio, TX, July 2010
- Y. Choe, D. Han, P. Huang, J. Keyser, J. Kwon, D. Mayerich, L. C. Abbott, Complete submicrometer scans of mouse brain microstructure: Neurons and vasculatures. Society for Neuroscience Annual Meeting, Chicago, IL, October 2009
- Y. Choe and J. Kwon. Internal state predictability as an evolutionary precursor of self-awareness and agency. In Neuroscience Meeting Planner, Washington, DC: Society for Neuroscience, 2008. Program No. 738.14. Online.
- Y. Choe, L.C. Abbott, J. Keyser, J. Kwon, David Mayerich, Z. Melek, and Bruce H. McCormick, Enhanced microvascular staining and tracing in large volumes of mouse brain tissue. Society for Neuroscience Annual Meeting, San Diego, CA, November 2007
- J. Kwon, D.M. Mayerich, J. Keyser, Y. Choe, L. Abbott, B.H. McCormick, Automatic Data Acquisition for Knife-Edge Scanning Microscopy. Industrial Affiliates Program, October 2007
- B.H. McCormick, L.C. Abbott, D.M. Mayerich, J. Keyser, J. Kwon, and Y. Choe, Automated Concurrent Serial-Sectioning and Microimaging of Whole Small Animal Brain at Submicron Resolution, Symposium on Imaging Neurons and Neural Activity, Cold Spring Harbor Laboratories, March 2007
- Bruce H. McCormick, Louise C. Abbott, Yoonsuck Choe, John Keyser, Jaerock Kwon, David Mayerich, Kristina Micheva, Stephen J. Smith, Multiscale Imaging of Mouse Brain Microstructure, National Institute of Health Multi-Scale Modeling Meeting, Washington D.C., April 2007
- D.M. Mayerich; Z. Melek, J. Kwon, J. Keyser, Y. Choe, L. Abbott, B.H. McCormick, Imaging and Mapping Brain Microvasculature, Industrial Affiliates Program, March 2007
- B.H. McCormick, L.C. Abbott, D.M. Mayerich, J. Keyser, J. Kwon, Z. Melek, Y. Choe, Full-Scale submicron neuroanatomy of the mouse brain, Society for Neuroscience Annual Meeting, Atlanta, GA, October 2006
- Bruce H. McCormick, Louise C. Abbott, Yoonsuck Choe, John Keyser, Jaerock Kwon, and David Mayerich, Full-scale Submicron Neuroanatomy to Constrain Computational Models of Biologically Accurate Neuron and Networks. WAM-BAMM (World Association of Modelers.Biologically Accurate Modeling Meeting), 3/24/2006, San Antonio, TX

Magazine Articles (Korean)

- Modem sharing using SAPS (SpartaCom Asynchronous Port Sharing), PC PLUS, September 1997 p391 – p397
- Making an Audio CD Player with Video Clip using TOOLBOOK 3.0, I LOVE PC, December 1995 p196 – p209
- Making a Hangul(Korean Alphabet) Word Processor, 1,2,3, C Program World Magazine, from June to August 1994
- Making an application using C language – Make PIMS application, Hello PC, January – May 1993
- Housekeeping account book software – Oink, Personal Computer, March 1990 p206 – p223
- Design and Implementation of HSIC (Hanyang Simplified Instructional Computer) Assembler, Personal Computer, September 1991 p102 – p114
- How to use multiple fonts in an application, Personal Computer, January 1991 p268 – p273, p310

Magazine Articles (Translation)
- Question and Answer C++, Paul DiLascia, Microsoft System Journal Korean Edition, January 1999
- Bug Slayer, Microsoft System Journal Korean Edition, November 1998
- Control Spy Exposes the Clandestine Life of Windows Common Controls, Part II, Microsoft System Journal Korean Edition, October 1998
- Control Spy Exposes the Clandestine Life of Windows Common Controls, Part I, Microsoft System Journal Korean Edition, August 1998
- Question and Answer C++, Microsoft System Journal Korean Edition, July 1998
- Minimizing the Memory Footprint of Your Windows CE-based Program, Microsoft System Journal Korean Edition, June 1998
- Question and Answer, Microsoft System Journal Korean Edition, May 1998
- Why Do Certain Win32 Technologies Misbehave in Windows NT services, Microsoft System Journal Korean Edition, April 1998
- Manipulate Windows NT Services by Writing a Service Control Program, Jeffery Richer, Microsoft System Journal Korean Edition, March 1998
- Q & A ActiveX/COM, Don Box, Microsoft System Journal Korean Edition, February 1998
- Under The Wood, Matt Pietrek, Microsoft System Journal Korean Edition, January 1998
- Windows Programming Supervisor, Microsoft System Journal Korean Edition, December 1997
- Introducing the Bugslayer: Annihilating Bugs in an Application Near You, John Robbins, Microsoft System Journal Korean Edition, November 1997
- Extend Developer Studio 97 With Your Own Add-ins, Macros, and Wizards, Steve Zimmerman, Microsoft System Journal Korean Edition, October 1997
- Seven Great Multithreading Ideas Part II, Microsoft System Journal Korean Edition, August 1997
- Q & A Win32, Microsoft System Journal Korean Edition, June 1997

Talks and Presentations
- Jaerock Kwon, Invited Talk: EAO-Net: Everything All at Once Network; toward eXplainable AI-based Controller using Sensory Motor Contingency Theory for Highly Automated Mobility, Association of Korean Neuroscientists (AKN) eTalk, March 15, 2023
- Jaerock Kwon, Invited Talk: Embodied Cognitive Approaches for Autonomous Vehicles, Hyundai Mobis, Jul 21, 2022
- Jaerock Kwon, AI Challenges for CAVs, TEDxUMDearborn, April 15, 2022
- Jaerock Kwon, Data, Network, and AI (D.N.A) at Northeast Regional Conference (NRC) 2022 "Behind the Scenes, Emerging Technology and Innovation," April 1 - 2, 2022
- Jaerock Kwon, Embodied Cognitive Vehicles - Bio-Inspired Intelligent Self-Driving Car, April 31, 2021
- Jaerock Kwon, Invited Talk: Machine learning and AI Challenges for Connected Automated Vehicles, Connected and Automated Vehicle Forum, UKC 2019 Chicago, August 16, 2019
- Jaerock Kwon, Toward Brain-Inspired Machine Intelligence for Autonomous Systems, Symposium on Advanced Mobility, SAIC-GM-Wuling Automobile, Guangxi Department of Science and Technology, Zhejiang Department of Science and Technology, SAIC Motor Corporation Ltd., Tongji University, China June 24 ~ 28 2019
- Jaerock Kwon, Practical Overview of Deep Learning for Building an Autonomous Vehicle, Handong University, September 18, 2018

- Jaerock Kwon, Invited talk: Deep Learning for Autonomous Vehicles, Wonkwang University, September 12, 2018
- Jaerock Kwon, Invited talk: Towards Intelligent Systems – Autonomous Vehicles, Samsung Electronics, August 1, 2018
- Jaerock Kwon, Invited talk: Image Data Restoration using Artificial Neural Network, Signal Intelligence Research Center, Hanyang University, Korea, July 8, 2016.
- Jaerock Kwon, Invited talk: Acquisition and Analysis of Mouse Brain Vasculature, High-Performance Visual Computing Lab, UNIST, June 30, 2016.
- Jaerock Kwon, Invited talk: Design and Implementation of Smart LED Lighting System Using Multi-Sensor Module. Dept. of Information and Communication Engineering at Wonkwang University, Korea, April 2014
- Jaerock Kwon, Invited talk: Development of a Wireless Multisensor LED Lighting System, BIT 3rd Annual World Conference of U-Homes, Dalian, China, June 2013
- Jaerock Kwon, Invited talk: Security Issues in Wireless Sensor Networks, Jeju National University, Korea, Oct 15, 2012.
- Jaerock Kwon, Invited talk: Wireless Sensor Network Development and Applications for LED system lighting, Workshop for LED Lighting Technologies and Education, Center for Advanced Electric Applications at Wonkang University, Korea, Oct 10, 2012.
- Jaerock Kwon, Invited talk: Computational Neuroscience, Mobile and Space Communications Lab at Hanyang University, Seoul, Korea, Sep 3, 2011
- Jaerock Kwon, Invited talk: Kettering University: A Professional Co-op Experience with a Real Difference, 2011 5th International Workshop on Practical Engineering Education, Cheonan, Korea, Aug 4, 2011.
- Jaerock Kwon, a special lecture in the Advanced Technical Vocational Education and Training (TVET) Program held by Human Resources Development Institute of Korea University of Technology & Education, Cheonan, Korea, August 1-5, 2011.
- Jaerock Kwon, and Yoonsuck Choe, Invited talk: Internal State Predictability as an Evolutionary Precursor of Self-Awareness and Agency, Cognoscenti Series, Texas A&M University, October 20, 2008
- Jaerock Kwon, Heejin Lim, and Yoonsuck Choe, Invited talk: Prediction, a Prerequisite to Goal-directed Behavior, and Its Possible Origin in Delay Compensation. IT Symposium, US-Korea Conference, Reston VA. August 10, 2007
- Yoonsuck Choe, Jaerock Kwon, and Heejin Lim, Invited talk: Prediction, a Prerequisite to Goal-directed Behavior, and Its Possible Origin in Delay Compensation. Metroplex Institute for Neural Dynamics, November 3, 2006

Teaching
- Robotic Manipulation
- Mobile Robotics
- Pattern Recognition and Neural Networks
- Introduction to Micocontrollers
- Microcomputers I
- Digital Systems I
- App Development for Mobile Devices
- Biomedical Image Processing and Visualization
- Real-Time Embedded Systems,
- Matlab and C Programming
- Interdisciplinary Design and Manufacturing

- Innovation and Entrepreneur Mindset

Student Advising

Graduate Students
- Aws Khalil (2021-), Ph.D. student
- Mohamed Houssem Fehri (2020-2021), Ph.D. student
- Jesudara Omidokun, (Winter 2022 - Fall 2022), Master student
- Dania Waqar, (Fall 2021 - Winter 2022), Master student
- Shivansh Singhal, (Winter 2022 -), Master student
- Shubham Nimbekar, (Winter 2022 -), Master student
- Ahmed Abdelhamed (2018-2020), Master student
- Balakrishna Yadav Peddagolla (2018-), Master student
- Nikhil Prabhu (2018-2019), Master student
- Ninad Doshi (2018-2019), Master student
- Shobit Sharma (2017-2019), Master student
- Mohamed Fasil Syed Ahamed (2017-2019), Master student
- Shruthi Raghavan (2014 - 2016): Nexteer Automotive
- Akanksha Ashwini (2015 -): Bosch North America
- LiDang(2015 - 2017): Bosch North America
- Amaradi Phanindra (2015 - 2016): Autoliv
- Nishanth Sriramoju (2015 - 2016)
- Jongil Lim (2013 - 2015)
- Seokju Lee (2013 - 2015)

Undergraduate Students
- Victor Ciroski, Machine Learning, Convolutional Neural Network (2018)
- Caspian Peavyhouse, Ignition Based Machine Access Control System (2018)
- Jaren Golenbiewski, Indoor Navigation System (2017)
- Alan Purdy, Remote Engineering Appliance for Control-Systems Troubleshooting (2017)
- Cole Heathcock, Development of a PC based user interface to enable transmission and manipulation of CAN based signals. (2017)
- Eric Golab, A Study of Neural Networks for Lane Detection. (2017)
- Ari Budiono, Ford Performance Car Identifier Mobile Application Prototype. (2017)
- Dalton Nofs, Protocol Conversion adapter: AVCLAN to A2B, (2017)
- Jessica Suer, A Comparison of Computer Generated Imagery Software Packages for Digital Tolerance Analysis Applications. (2017)
- Joseph May, Implementation of Passive Infrared and Capacitive Touch to Vending Equipment Using Lin Communication. (2014)
- Dalton Matznick, Cost Savings Analysis of Electrical Ladder Drawing Software and Process Changes (2013)
- Will Johnson, WIFI Communication Daughter Card Software (2014)
- Cody Lopez, Business Plan for the Infotainment Systems in Vehicles
- Patrick Brown, Web technologies in embedded environments allowing for rapid prototyping of rich user interfaces and platform independence. (2013)
- Ove Peronard, Analysis of Current C Code against MISRA and HIS metrics and Comparison with Gen7.2 and Previous Generation for Report Creation
- Andrew Meagher, Eliminating the Waste of Waiting (2014)

- David Green, Open and Closed Loop Testing Interface Using Labcar Mini for the Gasoline and Diesel FlexECU, 2013
- Matthew Clark, Creating an Elderly Monitoring Device Using Arduino and Android, 2014
- Alanna Gippin: Computed Tomography Image Reconstruction Micro Efficiency Analysis and Integration, 2013
- Eric Barch: Hardware Design and Implementation of a Bluetooth Low Energy Module, 2013
- Kevin Smith: TI10 Switchable ES Audio Solution. 2013
- William Lindeman: Interpreting Workout Gestures with Neural Networks, 2013
- Taimen Taylor: Automation of EnTech's Report Generation Process, 2012
- Anthony Marchioni: Learning Machine, 2012
- Eric Chu: BlackBerry Application for Monitoring Battery Testing for the Global Battery Systems Lab, 2011

Service

External

- Organizing Committee
  - President of KOCSEA (Korean Computer Scientists and Engineers Association in America) 2020 and 2021
  - Vice President of the Association of Korean Neuroscientists (2021 - 2022)
  - Council Member and Co-Chair of IT/Web Committee for the Association of Korean Neuroscientists (2021 – 2022)
  - Deputy Chair of IT/Web Committee for the Association of Korean Neuroscientists (2019 – 2020)
  - Vice President of KOCSEA and General Chair for the 20th KOCSEA (Korean Computer Scientists and Engineers Association in America) Technical Symposium 2019
  - Program Chair for the 19th KOCSEA (Korean Computer Scientists and Engineers Association in America) Technical Symposium 2018
  - Registration Chair, International Joint Conference on Neural Networks (IJCNN) 2017
  - Webmaster, International Joint Conference on Neural Networks (IJCNN) 2016
  - Membership & Registration Chair for the 18th KOCSEA (Korean Computer Scientists and Engineers Association in America) Technical Symposium 2017
  - Local Chair, Membership & Registration Chair for the 17th KOCSEA (Korean Computer Scientists and Engineers Association in America) Technical Symposium 2016
  - Membership & Registration Chair for the 16th KOCSEA (Korean Computer Scientists and Engineers Association in America) Technical Symposium 2015
  - Web Chair, The International Joint Conference on Neural Networks, 2015
  - Registration Chair and Communications Chair for the 15th KOCSEA (Korean Computer Scientists and Engineers Association in America) Technical Symposium 2014
  - Communications Chair for the 14th KOCSEA (Korean Computer Scientists and Engineers Association in America) Technical Symposium 2013
  - Communication Chair, TeK One 2014.
- Journal reviews
  - Energies (ISSN 1996-1073; CODEN: ENERGA), 2020
  - Sensors (ISSN 1424-8220; CODEN: SENSC9), 2019
  - IEEE/ASME Transactions on Mechatronics (IEEE-ASME T MECH), 2018

- - - IEEE Transactions on Neural Networks and Learning Systems, 2018
    - Journal of Automation in Construction, 2018
    - Journal of Information and Communication Convergence Engineering, 2017, 2018
    - IEEE/ASME Transactions on Mechatronics (IEEE-ASME T MECH), 2016
    - Microvascular Research, 2016, 2017
      - Outstanding Reviewer - Microvascular Research, 2017
      - Recognized Reviewer - Microvascular Research, 2016
    - Reviewer, The Scientific World Journal, Electrification and Renewable Energy Generation (EREG)
    - Reviewer, Data & Knowledge Engineering (DKE) journal.
  - Program Committee / Session Chair / Conference Paper Reviewer
    - Program Committee,
      - International Conference on Pattern Recognition Applications and Methods (ICPRAM 2019).
      - ACIT 2018: 6th ACM/ACIS International Conference on Applied Computing and Information Technology
      - 17th Annual IEEE International Conference on Electro/Information Technology, 2018
      - International Conference on Pattern Recognition Applications and Methods (ICPRAM 2018).
      - International Joint Conference on Neural Networks (IJCNN) 2017.
      - International Joint Conference on Neural Networks (IJCNN) 2016.
      - International Joint Conference on Neural Networks (IJCNN) 2014.
      - International Conference on Pattern Recognition Applications and Methods (ICPRAM 2014).
      - International Conference on Pattern Recognition Applications and Methods (ICPRAM 2013).
      - Nature and Biologically Inspired Computing (NaBIC) 2012.
      - Nature and Biologically Inspired Computing (NaBIC) 2011.
      - International Conference on Pattern Recognition Applications and Methods (ICPRAM 2012)
    - Reviewer
      - International Joint Conference on Neural Networks (IJCNN) 2012.
      - Neurocomputing journal, 2012.
      - IEEE Symposium Series on Computational Intelligence 2013.
      - The 16th International Conference on Neural Information Processing (ICONIP'09)
    - Technical Committee of International Joint Conference on Neural Networks (IJCNN), 2008
    - Session Chair, International Conference on Pattern Recognition Applications and Methods (ICPRAM 2014).
  - Membership
    - Member, Institute of Electrical and Electronics Engineers (IEEE)
    - Member, IEEE Computational Intelligence Society
    - Member, International Neural Network Society (INNS)
    - Member, Society for Neuroscience (SfN)
  - Grant reviews
    - NSF MRI review 2016

○ NSF IDBR review 2015
○ NSF MRI review 2014

Intramural (University of Michigan-Dearborn)
- Advisor - SAE MobilityForward: AI Mini Challenge
    ○ 3rd Places on Solutions Report, Presentation, and Booth.
- Advisor - Intelligent System Club
    ○ ROS2 workshop (Feb 22, 2022 - April 12, 2022)

Intramural (Kettering University)
- Faculty Senate for Computer Engineering, 2016-Present
- FOLA (Friends of the Library and Archives) Board of Directors 2015-2016 n Kettering University Innovation Fellow 2012-2013
- EE Faculty Search Committee 2013.
- Curriculum committee of Computer Engineering, 2010-2011
- Judge, FIRST Robotics District Competition (FRC) 2011 at Kettering
- Pre-College Camps
    ○ Computer Engineering Summer Day Camp II for Kettering University's Pre-college Program, 2013 – Present.
    ○ Computer Engineering Summer Day Camp for Kettering University's Pre-college Program, 2011 – Present.

Scientific Software
- KESMSuite: Image processing package for KESM images and KESM Web Brain Atlas.
    ○ https://github.com/jrkwon/KESMSuite
    ○ Composer/Cropper/GenMergerInfo/Merger/Relighter/TissueAreaDetector/TissueAreaOutlierRem
- KESM Image/Volume Browser (2008): A visualization system for KESM data
- KESM Unit Volume Maker (2008): A volume (a stack of images) extractor from multi-scale and multiple-column image stacks.
- KESM Image Cropper (2008): An image cropper removing noise and uneven light with automatic image registration.
- KESM Image Resizer (2008): Resize images from image stacks
- KESM Image Acquisition System (2007): A controller application for a precision positioning system and an image capture system. Imaging for the whole mouse brain has been done automatically with minimum human intervention.

VTK for Visualization, ITK for image process and image file manipulations, ImageMagick for some image process, Qt for GUI. Win32 API and Microsoft Windows MFC were used for KESM Image Acquisition System. Eclipse, and Visual Studio are being used for IDE.

Software
- For recent work, refer to https://github.com/jrkwon
    ○ MIR Vehicle: ROS based Research Platform for Autonomous Vehicle Applications: https://github.com/jrkwon/mir_vehicle_bmw
    ○ End-to-end learning: training a self-driving car on TORCS: https://github.com/jrkwon/mir_torcs
    ○ ROS based autonomous vehicle testbed: https://github.com/jrkwon/mirvehicle_ws

- ○ The final project of the Udacity Self-Driving Car Nanodegree: Programming a Real Self-Driving Car: https://github.com/jrkwon/CarND-Capstone
  - ○ Semantic segmentation using Fully Convolutional Network (FCN): https://github.com/jrkwon/CarND-Semantic-Segmentation
  - ○ Path planning in a simulated highway: https://github.com/jrkwon/CarND-Path-Planning-Project
  - ○ Model Predictive Control (MPC) for a simulated car: https://github.com/jrkwon/CarND-MPC-Project
  - ○ PID control for a simulated car: https://github.com/jrkwon/CarND-PID-Control-Project
  - ○ Localization in a simulated environment: https://github.com/jrkwon/CarND-Kidnapped-Vehicle-Project
  - ○ Extended Kalman Filter/Unscented Kalman Filter to estimate the state of a moving object of interest with noisy lidar and radar measurements: https://github.com/jrkwon/CarND-Extended-Kalman-Filter-Project, https://github.com/jrkwon/CarND-Unscented-Kalman-Filter-Project
  - ○ A software pipeline to detect vehicles and identify the lane boundaries in a video, https://github.com/jrkwon/CarND-Vehicle-Detection, https://github.com/jrkwon/CarND-Advanced-Lane-Lines
  - ○ End-to-end learning: deep neural networks and convolutional neural networks to clone driving behavior: https://github.com/jrkwon/CarND-Behavioral-Cloning-P3
  - ○ Traffic sign classification: https://github.com/jrkwon/CarND-Traffic-Sign-Classifier-Project

- An application platform for embedded systems, (written in ARM C for the main system and Visual C/C++ for the emulator), 2001, 2002
- A layout engine for the DTV data browser, (written in ARM C), 1999
- An answering machine, a phone, and a fax application for LG-IBM PC, (written in Visual C/C++), 1997, 1998
- A Telephony module using TAPI and Hayes modem command for LG-IBM PC, (written in Visual C/C++), 1996, 1997
- An audio CD player having video clips, (written in Toolbook 3.0), 1995
- An Hangul (Korean Alphabet) text editor, (written in Borland C/C++), 1994
- A PIMS application, (written in Turbo C 2.0), 1993
- An assembler for Hanyang Simplified Instructional Computer (HSIC), (written in Turbo C 2.0), 1991
- A housekeeping account book, (spreadsheet style, but simplified, and easy to use), (Turbo C 2.0), 1990

Technology Proficiencies
- Machine Learning Toolkit/Library: Keras, TensorFlow
- Robot Operating System (ROS)
- Android Programming
- iOS Programming
- Scientific programming in C/C++, Matlab, Python
- Web programming in Visual Basic, ASP, HTML, Javascript
- Visualization Tool Kit (VTK), Insight Segmentation and Registration Toolkit (ITK), Visual C/C++, MFC, Qt

- Database: MS Access, MS-SQL
- ARM Cortex M4
- TI CC254x
- Bluetooth Low Energy (BLE)
- Systems: Linux (Ubuntu), Windows, Mac OS X.

Extra Activities
- Member of baseball team, Ann Arbor Fighters, 2010 - current
- Member of a softball team, Taiwanese student association softball team (Actually, the team is an international team despite its name)
- Member of a baseball team, LG Woomyeon Elite (an associated baseball team of LG Research Laboratories) baseball team as pitcher, 2nd baseman or right fielder, 1994 - 1999 and 2002 - 2004
- Member of a student association for studying Korean language. Research on the relationship between language and the societal lives of the language users. March 1988 – January 1992
- A co-founder of a computer club, Hantlary in Electronic Communication Engineering Department, College of Engineering, Hanyang University, 1989