Junbong Jang

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EDUCATION

Master of Science (M.S.) in Artificial Intelligence

Korea Advanced Institute of Science and Technology (**KAIST**), Daejeon, South Korea — August 2021 - Current

Bachelor of Science in Computer Science

Worcester Polytechnic Institute (**WPI**), Worcester, MA — August 2016 - December 2019

PROFESSIONAL EXPERIENCES

M.S. Student, KAIST, Dr. Tae-Kyun Kim — August 2021 – Current

- Develop the first deep learning model that finds point-to-point correspondences along the cellular contour in live cell videos taken by phase-contrast and fluorescence microscopies.
    - Our paper is accepted to CVPR 2023.
- Collaborate with UMass Chan Medical School to triage gallbladder pathologies such as non-urgent cholelithiasis and acute cholecystitis using ultrasound cine video clips by deep learning video classifier.
    - Submitted our work to KSUM 2023 for oral presentation.

Research Assistant II, Boston Children's Hospital, Dr. Kwonmoo Lee — October 2020 – August 2021

Research Associate, WPI, Dr. Kwonmoo Lee — February 2020 – October 2020

- Develop a deep learning-based segmentation pipeline and proved the effectiveness of training on the multi-microscopy dataset comprised of live cell videos taken by phase-contrast and fluorescence microscopies.
    - Published our work in Cell Reports Methods in 2021.
- Collaborate with UMass Chan Medical School to create a deep learning-based pipeline to screen the adequacy of Fine Needle Aspiration (FNA) samples before staining from thyroid nodule patients.
    - Submitted our work to Scientific Reports.

Undergraduate Thesis, WPI, Dr. Dmitry Korkin — June 2019 – December 2019

- Joint Neuroscience Research with McLean Hospital to discover significant features that contribute to depression, dissociative disorder, or suicidal ideation and diagnose mental illness and suicidality from clinical and MRI data.
- Diagnose suicidality with 0.83 F1-score using the clinical dataset and diagnose depression, dissociative disorder, and PTSD with 0.9 F1-score using the MRI dataset by random forest model.
    - Published our work in European Journal of Psychotraumatology in 2022.

PUBLICATIONS

- **J. Jang**, K. Lee, T-K. Kim. Unsupervised Contour Tracking of Live Cells by Mechanical and Cycle Consistency Losses. *IEEE/CVF Conference on* ***Computer Vision and Pattern Recognition***. (2023)

- S Srinivasan, NG Harnett, L Zhang, MK. Dahlgren, **J. Jang**, …, D. Korkin, L. Lebois. Unravelling psychiatric heterogeneity and predicting suicide attempts in women with trauma-related dissociation using artificial intelligence. ***European Journal of Psychotraumatology.*** 13.2. (2022)
- **J. Jang**, C. Hallinan, K. Lee. Protocol for live cell image segmentation to profile cellular morphodynamics using MARS-Net. ***STAR protocols***. 3.3. (2022)
- **J. Jang***, C. Wang*, X. Zhang, H. Choi, X. Pan, …, K. Lee. A deep learning-based segmentation pipeline for profiling cellular morphodynamics using multiple types of live cell microscopy. ***Cell Reports Methods***. 1, 100105. (2021)
- H. Choi, C. Wang, X. Pan, **J. Jang**, M. Cao, J. Brazzo, Y Bae, K. Lee. Emerging machine learning approaches to phenotyping cellular motility and morphodynamics. ***Physical Biology***. (2021)
- K. Vaidyanathan, C. Wang, A. Krajnik, …, **J. Jang**, S. Heo, J. Kolega, K. Lee, Y. Bae. A machine learning pipeline revealing heterogeneous responses to drug perturbations on vascular smooth muscle cell spheroid morphology and formation. ***Scientific Reports***. 11, 23285. (2021)

TEACHING EXPERIENCES

Daewoo Shipbuilding & Marine Engineering (DSME) Capstone, KAIST March 2023 – Current

February 2022 – March 2022

- Mentored students from DSME to detect circuit components by YOLOv6 and read their specifications by Tesseract Optical Character Recognition (OCR) on the electrical schematics.

Statistics Korea Capstone, KAIST September 2022 – October 2022

September 2021 – October 2021

- Mentored students from Statistics Korea to count rice grains in an image by YOLOv6 and solve the class-imbalanced problem of detecting chaff by anomaly detection.

Biological Data Mining, WPI October 2019 - December 2019

- Taught development of machine learning and neural network models in Python.

Systems Programming Concepts, WPI August 2019 - October 2019

- Taught programming in C/C++ and test-driven development

AWARDS & FUNDING

Dongwon AI Full Scholarship, KAIST August 2021 – Current

$94,500 Merit Scholarship, WPI August 2016 - December 2019