JAE MYUNG KIM

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RESEARCH INTEREST

Bayesian Deep Learning, Uncertainty Estimation, Unsupervised Learning, Weak Supervision, Interpretation

EDUCATION

Seoul National University, Seoul, South Korea   2018 - Present
M.S. in Electrical and Computer Engineering   Advised by Jungwoo Lee
Best Dissertation Award

Seoul National University, Seoul, South Korea   2011 - 2018
B.S. in Electrical and Computer Engineering
2-year absence to fulfill military duty (2013 - 2015)

Peking University, Beijing, China   Jul. 2015
International academic exchange program for engineering students

PUBLICATIONS/PREPRINTS

International

[1] DropoutCAM: Dropout Uncertainty for Weakly Supervised Object Localization
Jae Myung Kim, Yeongwook Kim, Sungyeob Han, and Jungwoo Lee
Submitted

[2] REST: Performance Improvement of a Black Box Model via RL-based Spatial Transformation
Jae Myung Kim*, Hyungjin Kim*, Chanwoo Park*, and Jungwoo Lee
In *Proceedings of 34th AAAI Conference on Artificial Intelligence*, 2020

[3] Exploring linearity of deep neural network trained QSM: QSMnet+
Woojin Jung, Jaeyeon Yoon, Joon Yul Choi, **Jae Myung Kim**, Yoonho Nam, Eung-Yeop Kim, and Jongho Lee
NeuroImage, 2020

[4] Sampling-based Bayesian Inference with Gradient Uncertainty [pdf]()
Chanwoo Park, **Jae Myung Kim**, Seok Hyeon Ha, and Jungwoo Lee
In NIPS Workshop on Bayesian Deep Learning, 2018

Domestic

[1] Classifying Malignant Breast Cancer by Multiple Instance Learning
Jae Myung Kim and Jungwoo Lee
in Joint Conference on Communication and Information, 2019

RESEARCH EXPERIENCE

Uncertainty Estimation   2018 - 2019
· Developed a sample efficient uncertainty estimation method that generates a small number of weight samples. We define a new measure to quantify 'gradient uncertainty' which indicates whether the weights are near local minimum. Accepted at NIPS Workshop on Bayesian Deep Learning, 2018.
· Developing a sampling-free epistemic uncertainty estimation method using jacobian, which can be interpreted as a noise injection in Bayesian Neural Network. (ongoing)

Uncertainty Usage in Other Tasks 2019

· Developed robustness to the shift in data distribution when the black-box model is given. Reinforcement learning and the confidence score (prediction probability or epistemic uncertainty) is used for training additional network. Accepted at AAAI conference, 2020.
· Proposed a new Class Activation Map (CAM) method which achieved state-of-the-art in a weakly supervised object localization problem. The proposed method utilizes uncertainty obtained from dropout layers. Currently under review.
· Developing a model that predicts the re-occurrence of the lung cancer given the whole-slide image of the lung tissue. Aleatoric uncertainty makes sense for providing interpretation of the model's prediction in a multiple instance setting. (ongoing)

TEACHING EXPERIENCE

Teaching Assistant, Introduction to Deep Learning, SNU   Sep. - Dec. 2018
Lectured python tutorial, managed middle and final project, answered questions in person and online, marked assignments, and proctored exams

Major Course Assistant, Introduction to Data Structure, SNU   Sep. - Dec. 2017
Helped students who had difficulty understanding Data Structure course. Ran Q&A hours every week, answered questions in person and online

FELLOWSHIPS & AWARDS

Full Tuition, National Scholarship for Science and Engineering   2011 - 2017
Korea Student Aid Foundation

Silver Medal, 23rd Korea Mathematical Olympiad (KMO)   2009
Korea Mathematical Society

WORK EXPERIENCE & OTHER ACTIVITIES

HodooAI (Startup Company), Reseach Engineer   2018 - Feb. 2020

· Worked in the project that deals with generative models in the computer vision tasks.
· Participated in *Fake Image Discrimination* challenge sponsored by the Korean government. Ranked under top-9 among competitors.

Deepest (SNU Deep Learning study club)   2017 - 2018

· Lectured *Introduction to Bayesian Deep Learning* and *Tutorial on SG-MCMC*
· Participated in various projects such as *Caricalture-Human translation using CycleGAN* and *Pikachu Volleyball Game Reinforcement Learning*

Cleanfly (Startup Company), Software Engineer Intern   Jan. - Jun. 2017

· Worked as a back-end developer and a data visualization programmer

ROKAF (Republic of Korea Air Force), Sergant   2013 - 2015

· Representative of battalion soldiers for 6 months
· Discharged from the army with the reward for a great leader

TNT (SNU tennis club)   2012 - Present

· Winner, 20th SNU Tennis Double Competition in group B (tennis career less than 4 years), 2016
· Winner, 16th SNU Tennis Single Competition in group C (tennis career less than a year), 2012

Volunteer   2015 - Present

· Volunteered a pediatric care program organized by the Children's Hospital at SNU, 2016
· Volunteered in sharing briquettes, 2017
· Sponsers international medical relief organization, a regular sponsor