

Gukyeong Kwon

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EDUCATION

- **Georgia Institute of Technology** Atlanta, GA
Ph.D. in Electrical and Computer Engineering (Advisor: Dr. Ghassan AlRegib) August 2015 – Present
M.S. in Electrical and Computer Engineering (GPA: 4.0/4.0) August 2015 – May 2018
- **Sungkyunkwan University (SKKU)** Suwon, South Korea
B.S. in Electronic and Electrical Engineering (GPA: 4.29/4.5) March 2009 – August 2015

RESEARCH AND PROJECT

- **Aberrant Event Detection for Autonomous Vehicles** Georgia Tech
Graduate Research Assistant August 2018 – Present
 - Develop algorithms to detect driving events occurring in unexpected ways to ensure safe autonomous driving.
 - Focus on detecting out-of-distribution samples which are not included in the training set and analyzing the characteristic behavior of CNNs for such samples.
- **Vision-Based Driver's Misbehavior Detection** Panasonic Automotive
Deep Learning Research Intern May 2018 – July 2018
 - Developed deep learning based driver's pose estimation and hand detection algorithms using Tensorflow.
 - Improved computational time for hand detection algorithm from 0.35 milliseconds to 11 microseconds by implementing parts of the algorithm in C++.
- **Unsupervised Representation Learning for Interpretable Filter Sets** Georgia Tech
Graduate Research Assistant December 2017 – May 2018
 - Achieved interpretable and task-generalizable filter sets by proposing a regularization technique for autoencoder.
 - Conducted research on learning disentangled high-level visual concepts through the variational autoencoder (VAE) implemented in PyTorch.
- **Robust Visual Understanding Under Challenging Conditions** Georgia Tech
Graduate Research Assistant September 2017 – December 2017
 - Introduced a large-scale (>2,000,000 images) traffic sign recognition dataset (CURE-TSR) which is among the most comprehensive datasets with controlled synthetic challenging conditions. [\[Website\]](#)
 - Benchmarked the robustness of data-driven algorithms and analyzed shortcomings.

SELECTED PUBLICATIONS

- **G. Kwon***, M. Prabhushankar*, D. Temel and G. AlRegib, “**Distorted Representation Space Characterization Through Backpropagated Gradients**,” in *IEEE International Conference on Image Processing (ICIP)*, Taipei, Taiwan, September 2019. (*: equal contribution)
- **G. Kwon***, M. Prabhushankar*, D. Temel and G. AlRegib, “**Semantically Interpretable and Controllable Filter Sets**,” in *IEEE International Conference on Image Processing (ICIP)*, Athens, Greece, October 2018. (*: equal contribution) [\[PDF\]](#) [\[Website\]](#)
- M. Aabed, **G. Kwon**, and G. AlRegib, “**Power of Tempospatially Unified Spectral Density for Perceptual Video Quality Assessment**,” in *IEEE International Conference on Multimedia Expo (ICME)*, Hong Kong, July 2017. (Finalist of the World's FIRST 10K Best Paper Award) [\[PDF\]](#) [\[Slide\]](#) [\[Code\]](#)
- **G. Kwon**, M. Aabed, and G. AlRegib, “**POTUS: Perceptual Video Quality Assessment via Power of Tempospatially Unified Spectral Density**,” submitted to *IEEE Transactions on Circuits and Systems for Video Technology*, May 2019.

AWARDS & SCHOLARSHIPS

- **Finalist of the World's FIRST 10K Best Paper Award (Top 3%) @ ICME 2017** July 2017
- **National Science Engineering Scholarship** March 2013

PROGRAMMING SKILLS

- **Languages:** Python, MATLAB, C/C++, **Deep Learning Framework:** PyTorch, Tensorflow