

Seong Jae Hwang

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RESEARCH INTEREST

My research is focused on developing *statistical machine learning* and *deep neural network* methods for analyzing sequential data in *machine learning*, *computer vision* and *medical imaging*. On the technical side, I develop algorithms for sequential data from small to large scales with statistical machine learning and sequential deep learning models. On the application side, my interests range from neuroscientific discoveries to machine learning/computer vision applications.

RESEARCH EXPERIENCE

Assistant Professor , Department of Computer Science, University of Pittsburgh	2019 - Present
Graduate Research Assistant , University of Wisconsin - Madison	2015 - 2019
Graduate Project Assistant , The Waisman Center	2014 - 2015
Graduate Research Assistant , University of Pennsylvania	2013 - 2014

EDUCATION

University of Wisconsin - Madison , Computer Sciences, Ph.D. Advisor: Vikas Singh	2014 - 2019
University of Pennsylvania , Robotics, M.S.E. Advisor: Camillo J. Taylor	2011 - 2013
University of Illinois at Urbana-Champaign , Computer Science, B.S.	2007 - 2011

PUBLICATIONS

Published or Accepted

1. **Seong Jae Hwang**, Zirui Tao, Won Hwa Kim, Vikas Singh, “Statistical Analysis of Longitudinally and Conditionally Generated Longitudinal Neuroimaging Measures via Conditional Recurrent Flow”, *The First Workshop on Statistical Deep Learning in Computer Vision, International Conference on Computer Vision (ICCV)*, 2019.
2. **Seong Jae Hwang**, Zirui Tao, Won Hwa Kim, Vikas Singh, “Conditional Recurrent Flow: Conditional Generation of Longitudinal Samples with Applications to Neuroimaging”, *International Conference on Computer Vision (ICCV)*, 2019.
3. **Seong Jae Hwang**, Ronak R. Mehta, Hyunwoo J. Kim, Vikas Singh, “Sampling-free Uncertainty Estimation in Gated Recurrent Units with Applications to Normative Modeling in Neuroimaging”, *Conference on Uncertainty in Artificial Intelligence (UAI)*, 2019.
4. **Seong Jae Hwang**, Joonseok Lee, Balakrishnan Varadarajan, Zheng Xu, Ariel Gordon and Apostol (Paul) Natsev, “Large-Scale Training Framework for Video Annotation”, *Conference on Knowledge Discovery and Data Mining (KDD)*, 2019. [oral presentation]

5. Courtney A. Miller, **Seong Jae Hwang**, Meghan M. Cotter, Hourii K. Vorperian, “Cervical vertebral growth and emergence of sexual dimorphism: A developmental study using computed tomography”, *Journal of Anatomy*, 2019.
6. Won Hwa Kim, Annie M. Racine, Nagesh Adluru, **Seong Jae Hwang**, Kaj Blennow, Henrik Zetterberg, Cyhthia M. Carlsson, Sanjay Asthana, Rebecca L. Kosciak, Sterling C. Johnson, Barbara B. Bendlin, Vikas Singh, “Cerebrospinal fluid biomarkers of neurofibrillary tangles and synaptic dysfunction are associated with longitudinal decline in white matter connectivity: a Multi-resolution graph analysis”, *NeuroImage: Clinical*, 2018.
7. **Seong Jae Hwang**, Nagesh Adluru, Won Hwa Kim, Sterling C. Johnson, Barbara B. Bendlin, Vikas Singh, “Associations between PET Amyloid Pathology and DTI Brain Connectivity in Preclinical Alzheimer’s Disease”, *Brain Connectivity*, 2018.
8. **Seong Jae Hwang**, Sathya N. Ravi, Zirui Tao, Hyunwoo J. Kim, Maxwell D. Collins, Vikas Singh, “Tensorize, Factorize and Regularize: Robust Visual Relationship Learning”, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2018.
9. Won Hwa Kim, Mona Jalal, **Seong Jae Hwang**, Sterling C. Johnson, Vikas Singh, “Online Graph Completion: Multivariate Signal Recovery in Computer Vision”, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017.
10. Won Hwa Kim, **Seong Jae Hwang**, Nagesh Adluru, Sterling C. Johnson, Vikas Singh, “Adaptive Signal Recovery on Graphs via Harmonic Analysis for Experimental Design in Neuroimaging”, *European Conference on Computer Vision (ECCV)*, 2016.
11. **Seong Jae Hwang**, Nagesh Adluru, Maxwell D. Collins, Sathya N. Ravi, Barbara B. Bendlin, Sterling C. Johnson, Vikas Singh, “Coupled Harmonic Bases for Longitudinal Characterization of Brain Networks”, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016.
12. **Seong Jae Hwang**, Maxwell D. Collins, Sathya N. Ravi, Vamsi K. Ithapu, Nagesh Adluru, Sterling C. Johnson, Vikas Singh, “A Projection Free Method for Generalized Eigenvalue Problems with a Nonsmooth Regularizer”, *International Conference on Computer Vision (ICCV)*, 2015.

Conference Abstracts

1. **Seong Jae Hwang**, Rebecca L. Kosciak, Tobey J. Betthausen, Zirui Tao, Won Hwa Kim, Sterling C. Johnson, Vikas Singh, “Predicting amyloid accumulation trajectories in a risk-enriched Alzheimer’s disease cohort with Deep Conditional Neural Networks”, *Alzheimer’s Association International Conference (AAIC)*, 2019.
2. Zirui Tao, Ronak R. Mehta, **Seong Jae Hwang**, Rebecca L. Kosciak, Erin Jonaitis, Sterling C. Johnson, Vikas Singh, “A Normative Modeling Based Analysis of Amyloid, Cognition, and Tau in Preclinical Alzheimer’s Disease”, *Alzheimer’s Association International Conference (AAIC)*, 2019.
3. Xingjian Zhen, Rudrasis Chakraborty, Nicholas Vogt, **Seong Jae Hwang**, Sterling C. Johnson, Barbara B. Bendlin, Vikas Singh, “Sequential Deep Learning Algorithms show structural connectivity differences by amyloid status”, *Alzheimer’s Association International Conference (AAIC)*, 2019.
4. Courtney A. Miller, **Seong Jae Hwang**, Meghan M. Cotter, Hourii K. Vorperian, “Sex-specific cervical vertebral growth in height & depth: A study using computed tomography”, *American Association of Physical Anthropologists*, 2019.
5. **Seong Jae Hwang**, Sathya N. Ravi, Nagesh Adluru, Barbara B. Bendlin, Sterling C. Johnson, Vikas Singh, “Data-Driven Propagation Modeling of PET-Derived Alzheimer’s Disease Pathology in a Preclinical Cohort”, *Alzheimer’s Association International Conference (AAIC)*, 2018.
6. Won Hwa Kim, **Seong Jae Hwang**, Nagesh Adluru, Sterling C. Johnson, Vikas Singh, “Graph Completion: A Generalization of Netflix Prize Problem to Designing Cost Effective Neuroimaging Trials in Preclinical AD”, *Alzheimer’s Association International Conference (AAIC)*, 2017.

7. **Seong Jae Hwang**, Won Hwa Kim, Barbara B. Bendlin, Nagesh Adluru, Vikas Singh, “Multi-Resolution Analysis of DTI-Derived Brain Connectivity and the Influence of PET-Derived Alzheimer’s Disease Pathology in a Preclinical Cohort”, *Alzheimer’s Association International Conference (AAIC)*, 2016. [oral presentation]

Patents

1. Won Hwa Kim, **Seong Jae Hwang**, Nagesh Adluru, Sterling C. Johnson, Vikas Singh, “Computerized System for Efficient Augmentation of Data Sets”, 2018, US20180113990A1.
2. Zheng Han, Xiaowei Dai, **Seong Jae Hwang**, Jason Fass, “Fast object tracking framework for sports video recognition”, 2016, US9449230B2.

INDUSTRY WORK EXPERIENCE

Research Intern , Google Research	Summer 2019
Research Intern , Google Research	Summer 2018
Computer Vision Scientist Intern , Zepp Labs, Inc.	Summer 2014
Software Development Intern , Yahoo	Summer 2011
Android Software Development Intern , Motorola	Summer 2010

PROFESSIONAL SERVICES

Conference Reviewer

Medical Image Computing and Computer Assisted Intervention (MICCAI)	2017, 2018, 2019
Advances in Neural Information Processing Systems (NIPS)	2018, 2019
International Conference on Machine Learning (ICML)	2018, 2019
International Conference on Learning Representation (ICLR)	2019
Conference on Computer Vision and Pattern Recognition (CVPR)	2019
International Conference on Computer Vision (ICCV)	2019
Conference on Uncertainty in Artificial Intelligence (UAI)	2019

Journal Reviewer

Brain Connectivity	2018, 2019
NeuroImage	2019
Transactions on Image Processing (TIP)	2019

HONORS AND AWARDS

NIH Predoctoral Fellowship , University of Wisconsin - Madison Computation and Informatics in Biology and Medicine (CIBM)	2015 -2018
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