Serim Ryou

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EDUCATION

California Institute of Technology   Pasadena, CA
Ph.D. Candidate in Electrical Engineering   *Sep. 2014 – Present*
  Adviser: Pietro Perona

California Institute of Technology   Pasadena, CA
MS in Electrical Engineering   *2016*

Korea University   Seoul, South Korea
BS in Electrical Engineering   *Mar. 2009 – Feb. 2014*
  Top graduating student in College of Engineering

KEYWORDS

Computer vision, Machine learning, Keypoint estimation, Graph neural network, Unsupervised learning

EXPERIENCE

Research Assistant   Sep. 2014 – Present
Computational Vision Lab, Caltech   *Pasadena, CA*
- Developed a multi-person pose estimation algorithm for 2D images with people having interaction using convolutional recurrent neural networks
- Proposed a loss function which modulates the loss scale based on the sample difficulty
- Developed a keypoint discovery method using weak supervision
- Proposed an unsupervised keypoint discovery method that is directly applicable to animal behavior classification

Research Assistant   Jan. 2019 – Jan. 2020
The Reisman Group, Caltech   *Pasadena, CA*
- Curated the dataset of four ubiquitous reactions from the organic chemistry literature
- Explored methods to predict the optimal reaction conditions for organic chemistry experiments
- Proposed an attention-based graph neural network by incorporating the information from multiple graphs

Undergraduate Research Assistant   Mar. 2011 – Mar. 2013
Korea University   *Seoul, Korea*
- Proposed an image retargeting algorithm using semantic segmentation and saliency analysis
- Implemented seam carving and patch-based image retargeting algorithms for performance evaluation
- Developed a probability density function for hand tracking using depth and motion information
- Implemented wave motion detection and camshift algorithm

PUBLICATIONS

1. **Serim Ryou** and Pietro Perona, Weakly Supervised Keypoint Discovery (under review) 2021

2. Michael R. Maser*, Alexander Y. Cui*, **Serim Ryou***, Travis J. DeLano, Yisong Yue, Sarah E. Reisman, Multi-label Classification Models for the Prediction of Cross-Coupling Reaction Conditions, in *Journal of Chemical Information and Modeling (JCIM)* 2021

3. **Serim Ryou***, Michael R. Maser*, Alexander Y. Cui*, Travis J. DeLano, Yisong Yue, Sarah E. Reisman, Graph Neural Networks for the Prediction of Substrate-Specific Organic Reaction Conditions, in *ICML Workshop on Graph Representation Learning and Beyond* 2020

4. **Serim Ryou**, Seong-Gyun Jeong, Pietro Perona, Anchor Loss: Modulating Loss Scale Based on Prediction Difficulty, in *ICCV* 2019 (**Oral**)

5. **Serim Ryou** and Pietro Perona, Parsing Pose of People with Interaction, in *BMVC* 2018
   * denotes equal contribution

Technical Skills

Languages: Python, C/C++, MATLAB, OpenCV
Frameworks: PyTorch, Chainer, Keras
Developer Tools: Git, AWS

Teaching

EE148 Selected Topics in Computational Vision   2021 Spring
- Guest Lecturer (Lecture: *Pose Estimation*)

EE148 Selected Topics in Computational Vision   2020 Spring
- Teaching Assistant
- Guest Lecturer (Lecture: *Pose Estimation*)

Honors and Awards

Ph.D. Fellowship, *Korea Foundation for Advanced Studies (KFAS)*   2014 - 2016
Valedictorian of College of Engineering, *Korea University*   2014
National Scholarship for Science and Engineering, *KOSAF*   2012 - 2013
Guwon Scholarship, *The Guwon Scholarship Foundation*   2012 - 2013
Best Honors Scholarship, *Korea University*   2009, 2010
Honors Scholarship, *Korea University*   2010