Johanna S. Karras

jskarras@cs.washington.edu (408) 334-1589 johannakarras johannakarras

RESEARCH INTEREST

My research lies at the intersection of deep learning and computer vision. Currently, I am interested in image and video synthesis, multi-modal machine learning, and vision transformers.

EDUCATION

University of Washington Allen School **Seattle, WA**
PhD Computer Science *September 2021 - Current*
Computer Vision and Machine Learning
Co-advised by Dr. Steve Seitz, Dr. Ira Kemelmacher-Shlizerman, and Dr. Brian Curless

California Institute of Technology **Pasadena, CA**
B.S Computer Science, minor in Information and Data Science *September 2017 - June 2021*
GPA 3.8/4.0, Teaching Assistant, NCWIT Collegiate Award Finalist

KEY SKILLS

- Computer vision, deep learning, computational photography, object detection, and object tracking
- Machine learning proficiency in TensorFlow, Keras, and PyTorch
- Strong programming skills in Python, C++, C, Java, and MySQL
- Fluency in English, Finnish, Spanish, French

RESEARCH PROJECTS

Deep Neural Networks for Black Hole Imaging **Pasadena, CA**
Advised by Prof. Katie Bouman *April 2020 – June 2021*
- Researched the first deep neural network image reconstruction algorithms for black hole imaging.
- Showed improvement in average mean-absolute-error when compared to a state-of-the-art regularized maximum likelihood optimization method.
- Presented extended abstract and poster at the WiCV workshop at CVPR on June 19, 2021.
- See on project on Github.

Dual Task Learning for Species Classification and Annotation **Pasadena, CA**
Final Course Project for Prof. Pietro Perona *March 2021 - June 2021*
- Developed a convolutional neural network using transfer learning for simultaneous fine-grain image classification and multi-label attributes annotation using the Caltech UC-Davis Birds 200-2011 datasets. Showed 11% improved accuracy on fine-grain attributes classification.
- See project on Github.

PIMCO/Caltech: Independent Research Project **Pasadena, CA**
Mentored by Prof. Adam Wierman *October 2019 – March 2020*
- Developed novel machine learning and natural language processing methods for financial forecasting in a joint PIMCO/Caltech project. Achieved above state-of-the-art prediction accuracy.

PROFESSIONAL EXPERIENCE

Streetscope Inc. **Pasadena, CA**
Computer Vision & Machine Learning Intern *April 2021 – September 2021*
- Researched and implemented state-of-the-art deep neural network architectures for object detection, object tracking, and video processing using Tensorflow and Python.

J.P. Morgan & Chase **New York, NY**
Software Engineering Intern *June 2019 – August 2019*

- Designed and implemented a new internal-facing web app using React and Java, supported with Jules and Gaia Cloud Platform Service, in order to monitor the testing and integration of internal software projects.

Microsoft Artificial Intelligence & Research **Bellevue, WA**
Software Engineering "Explore" Intern *June 2018 – September 2018*

- Designed and implemented two new features for Cortana, a voice-controlled AI personal assistant, relating to midterm elections and real estate using machine learning, natural language processing, C, and new geospatial APIs.

AWARDS & RECOGNITIONS

- Google CSRMP 2021 (Computer Science Research Mentorship Program)
- NCWIT Collegiate Award Finalist, 2020 (National Center for Women in Computing)
- Caltech Amasa Bishop Travel Grant, 2020
- Caltech Summer Undergraduate Research Fellowship, 2020