Wilka Carvalho

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RESEARCH INTERESTS: Developing deep learning models that implicitly or explicitly infer and utilize hidden variables. Topics include variational inference, generative adversarial networks, and reinforcement learning.

EDUCATION

UNIVERSITY OF MICHIGAN–ANN ARBOR
Ph.D. in Computer Science
Expected May 2022 | Ann Arbor, MI

UNIVERSITY OF SOUTHERN CALIFORNIA (USC)
M.S. in Computer Science
Viterbi School of Engineering
Grad. May 2017 | Los Angeles, CA
GPA: 3.5

STONY BROOK UNIVERSITY (SBU)
B.S. in Physics
Grad. May 2015 | Stony Brook, NY
GPA: 3.5
Dean's List (2011-2015)

COURSEWORK

Natural Language Processing
Artificial Intelligence
Operating Systems
Linear Algebra
Differential Equations
Multi- and Uni-variate Calculus

SKILLS

RESEARCH
Learning Algorithms
Computational Modeling
Project Design
Large Library Development

PROGRAMMING
Python • C++ • C • LaTeX
MatLab • Javascript • PHP • HTML

SOFTWARE
Tensorflow • Theano • Keras • Neuron

SOFT SKILLS
Critical Thinking • Excellent Writing
Time- and Task-Management
Independence • Self-motivation

INTERESTS

traveling • chess • software development
improvisational • deadpan humor

RESEARCH EXPERIENCE

IBM RESEARCH | Machine Learning Research Intern
Sep 2017 – Present | IBM Alamaden, San Jose, CA
Leading development of an algorithm to defend convolutional neural networks from poisoning attacks using Tensorflow. We project neural activations into a low-dimensional space and cluster data accordingly, an idea I helped motivated. Our accuracy is above 96% with a false-positive and false-negative below 2%.

VISA RESEARCH | Machine Learning Research Intern
Jun 2017 – Present | Visa, Palo Alto, CA
Leading development and design of neural network that employs Bayesian inference and relational reasoning to answer context-dependent questions. Built using Tensorflow and the ParlAI natural language processing platform. Competitive with state-of-the-art.

MACHINE LEARNING GROUP | Research Assistant
Nov 2015 – May 2017 | USC, Los Angeles, CA
Led development of a neural network model in Theano that employed variational methods and adversarial training to perform domain adaptation on multivariate time-series. Led to a publication and a patent.

NUCLEAR PHYSICS GROUP | NSF LSAMP Scholar
Jan 2013 – Aug 2015 | SBU, Stony Brook, NY
Created a model for a DIRC particle detector and a corresponding Monte Carlo light simulator. Developed a pattern recognition algorithm that exploited physics, statistics, and geometry to identify particles from synthetic light data. Led software development of C++ libraries and programs used for simulations and analyses.

COMPUTATIONAL NEUROSCIENCE GROUP | NSF LSAMP Scholar
Sep 2014 – Dec 2014 | SBU, Stony Brook, NY
Performed spectral analyses on neural data to determine behavioral correlates of neural activity.

EMOTION AND SOCIAL COGNITION LABORATORY | Research Fellow
Jun 2014 – Aug 2014 | Caltech, Pasadena,
Developed a Trait Learning Task to learn about how people infer other's responses by observing their behavior. Built a free, web-based, general-purpose platform using Javascript, php, and HTML to administer online psychology experiments with user-input contingent progression.

HONORS & AWARDS

2017 GEM National Fellowship sponsored by IBM (declined)
2017 ICLR Travel Award
2015 NSF Graduate Research Fellowship (Neuroscience)
2015 SBU Provost Award for Academic Excellence ($\sim$ 0.5% of graduates chosen)
2014 SBU Researcher of the Month (1 school-wide monthly)
2014 HHMI Minority Undergraduate Research Fellowship
2013 Sigma Pi Sigma Physics Honor Society (only 2nd year student inducted)
2012 Scholar of Science, Technology, Engineering and Math