Curriculum Vitae

Emily Hand

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EDUCATION

Doctor of Philosophy, Computer Science *Expected August 2018*
Master of Science, Computer Science *2015*
University of Maryland College Park

Bachelor of Science in Computer Science and Engineering *2013*
Bachelor of Science, Applied Mathematics *2013*
University of Nevada Reno

EXPERIENCE

Research Intern
Diffbot *May 2017-present*
- Use semantic segmentation to localize facial attributes for accurate face descriptions and improved face detections.

Graduate Research Assistant
University of Maryland, College Park *August 2014-present*
- Improve attribute prediction for face verification in unconstrained face images using deep learning methods.
- Utilize relationships amongst attributes to improve prediction.

Research Intern
Naval Research Laboratory *April 2015-August 2015*
- Developed a method for neural networks, regularizing the network, and facilitating training of deeper networks.
- Worked on a team tasked with creating an automatic video surveillance system.

Research Intern
NASA Jet Propulsion Laboratory *Summer 2014*
- Incorporated stereo data into Random Forest classification of geologic types.
- Performed exhaustive testing on four new datasets collected from the Mojave Desert.
- Improved classification performance over the original algorithm by as much as 10% on some datasets.

Graduate Research Assistant
University of Maryland, College Park *August 2013-May 2014*
- Integrated internal and external meta-cognition into an artificial dialog agent (ALFRED) used as an interface for a task-oriented domain.

Research Intern
NASA AMES Research Center *Summer 2012, 2013*
- Developed a structure from motion framework compatible with other localization techniques for use on low-resolution rover and high-resolution planetary images with the Advanced Navigation subgroup of the Intelligent Robotics Group.

Undergraduate Research Assistant
University of Nevada, Reno *November 2010-December 2012*
- Improved performance of template tracking system using Random Projections in place of Principal Component Analysis for dimensionality reduction.
- Integrated Sparse Bundle Adjustment into the Structure from Motion system to improve accuracy.

NSF REU Participant
University of Central Florida *Summer 2011*
- Developed a template-based tracking framework for use in a larger human tracking system with a Ph.D. candidate.

TEACHING

Co-Instructor
University of Maryland, College Park *August 2017-December 2017*

- Gave lectures, created and graded homework, programming projects, and exams, and held office hours for undergraduate Machine Learning class.

Graduate Teaching Assistant
University of Maryland, College Park *August 2013-May 2014*

- Created and graded homework, quizzes, programming projects, and exams for undergraduate Artificial Intelligence class.

Undergraduate Teaching Assistant
University of Nevada, Reno *August 2012-December 2012*

- Graded homework and programming projects, and held office hours for undergraduate Algorithms class.

SERVICE

Women into Computer Science and Engineering (WICSE): UNR Student Member *November 2010-May 2013*
ACM: UNR Student Member *January 2011-May 2013*
SIAM: Student Member *August 2013-present*
IEEE: Student Member *February 2014-present*
ACM: Student Member *June 2014-present*
Girls Who Code: Facilitator (Instructor) *February 2017-present*
UMD Computer Science Graduate Organization: Chair *August 2017-present*

AWARDS AND HONORS

Dean's List University of Nevada, Reno *August 2009-May 2013*
Computer Science and Engineering Senior Service Award *May 2013*
Computer Science Dean's Fellowship University of Maryland, College Park *2013-2014, 2014-2015*
NSF Graduate Research Fellowship Program, Honorable Mention *2014*

COMPETITIONS

1. "Higher-Order Contract Counterexamples" abstract accepted into the ACM Student Research Competition of the International Conference on Functional Programming, 2014.
2. "Attributes for Improved Attributes: A Multi-Task Network for Attribute Recognition" abstract accepted into the University of Maryland Graduate Research Appreciation Day, 2016.

PUBLICATIONS

1. Guang Shu, Afshin Dehghan, Omar Oreifej, **Emily M. Hand**, Mubarak Shah, "Part-based Multiple-Person Tracking with Partial Occlusion Handling," in Computer Vision and Pattern Recognition, 2012.

2. Don Perlis, Mike Cox, Michael Maynord, Elizabeth McNany, Matthew Paisner, Vika Shivashankar, **Emily M. Hand**, Jared Shamwell, Tim Oates, Tongchun Du, Darsana Josyula and Manual Caro, "A Broad Vision for Intelligent Behavior: Perceptual Real-World Cognitive Agents," in Advances in Cognitive Systems, Workshop on Metacognition and Artificial Situated Agents 2013.

3. **Emily M. Hand**, Darsana Josyula, Matthew Paisner, Elizabeth McNany, Michael T. Cox and Don Perlis, "Two Approaches to Implementing Metacognition," in The Sixth International Conference on Advanced Cognitive Technologies and Applications, COGNITIVE 2014.

4. A.V. Nefian, X. Bouyssounouse, L. Edwards, T. Kim, **E. M. Hand**, J. Rhizor, M. Deans, G. Bebis, T. Fong, "Planetary Rover Localization within Orbital Maps," in the International Conference on Image Processing, 2014.

5. Leslie N. Smith, **Emily M. Hand**, Timothy Doster, "Gradual DropIn of Layers to Train Very Deep Neural Networks," in Computer Vision and Pattern Recognition, 2016.

6. Maya Kabkab, **Emily M. Hand**, Rama Chellappa, "On the Size of Convolutional Neural Networks and Generalization Performance," in International Conference on Pattern Recognition, 2016.

7. **Emily M. Hand**, Rama Chellappa. "Attributes for Improved Attributes: A Multi-Task Network Utilizing Implicit and Explicit Relationships for Facial Attribute Classification," AAAI Conference on Artificial Intelligence, 2017.

8. Pouya Samangouei, **Emily M. Hand**, Vishal M. Patel, Rama Chellappa (2017). "Active Authentication Using Facial Attributes," in Guodong Guo and Harry Wechsler (Eds.) *Mobile Biometrics* (pp. 131-153), London, UK, The Institution of Engineering and Technology.

9. **Emily M. Hand**, Carlos Castillo, Rama Chellappa. "Doing the Best We Can with What We Have: Multi-Label Balancing with Selective Learning for Attribute Prediction," AAAI Conference on Artificial Intelligence, 2018.