

CONNOR H. MCCURLEY

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SUMMARY OF QUALIFICATIONS

Pursuing Ph.D. in Electrical Engineering: Concentration in Machine Learning

Experience in Machine Learning applied to Remote Sensing applications

Obtained industry experience through internships at Oklahoma Gas & Electric

EDUCATION

Ph.D. Student in Electrical Engineering

Expected May 2022

University of Florida (A.B.E.T.), Gainesville, FL

- Concentration in Machine Learning and Pattern Recognition
- Faculty Advisor: Dr. Alina Zare
- Dissertation Committee: Dr. Paul Gader, Dr. Jose Principe, Dr. Joseph Wilson
- Dissertation: "Discriminative Manifold Embedding with Imprecise, Uncertain and Ambiguous Data"

Bachelor of Science in Electrical Engineering

May 2017

Oklahoma State University (A.B.E.T.), Stillwater, OK

Cum Laude

- Concentration in Communications, Controls, and Signal Processing
- Minor in Mathematics

RESEARCH INTERESTS

I am interested in exploring machine learning approaches applied to applications in remote sensing. Specifically, I look into approaches for dimensionality reduction and manifold estimation which learn from weak and imprecise groundtruth. Other areas of interest include: multi-resolution sensor fusion, target detection, metric embedding, semantic segmentation and multiple instance learning.

RESEARCH EXPERIENCE

Doctoral Student Researcher | University of Florida

June 2020 – Present

Discriminative Manifold Embedding with Imprecise, Uncertain and Ambiguous Data

- Developed approaches for discriminative manifold learning using weakly-labeled groundtruth
- Explored methods in deep learning for weakly-supervised semantic segmentation
- Compared developments to state-of-the-art techniques for manifold learning and metric embedding
- Applied developments to a variety of remotely-sensed data, including: infrared, visual spectrum and RGB imagery

Graduate Research Assistant | University of Florida

Feb 2019 – Present

Aided Target Recognition using Imprecise and Uncertain Data

- Collaborated with multiple universities and companies to achieve research objectives
- Developed machine learning methods for target detection in infrared and visual spectrum imagery
- Investigated approaches for target detection and semantic segmentation using weakly-labeled groundtruth
- Coded machine learning algorithms in Python and PyTorch
- Ran experiments to compare machine learning approaches
- Provided code and results deliverables on-time
- Communicated effectively with experienced researchers and U.S. Army representatives

Assistant Grant Writer | University of Florida

Oct 2019 – Jan 2020

AI Institute: Hybrid Statistical-Syntactic Artificial Intelligence for Assessing Agroecosystem Services

- Assisted in managing developing, writing, reviewing and submitting proposal for **multi-million dollar National Science Foundation Institute**
- Collaborated with researchers in fundamental artificial intelligence, agroecosystem ecology and economics
- Developed content for broader impacts of institute contributions
- Managed proposal writing timeline and kept team on schedule
- Combined individual sections across disciplines into single cohesive document
- Managed communications among over 30 faculty members and company representatives
- Kept precise meeting notes and promptly distributed summaries to team

Graduate Research Assistant | University of Florida

Aug 2017 – Feb 2019

Multi-sensor Fusion for Buried Object Detection

- Performed experimental and theoretical studies in explosive hazard detection
- Worked to develop algorithms employed on US Army hand-held metal detectors
- Developed approaches for soil interference removal and target detection using weakly-labeled groundtruth
- Coded machine learning algorithms in Matlab and Python
- Ran experiments to compare machine learning approaches
- Communicated effectively with experienced researchers and U.S. Army representatives

TEACHING & MENTORING

Graduate Mentor

Aug 2020 – Present

University of Florida

Gainesville, FL

- Lead and directed 6 undergraduate and 1 M.S. student on research project
- Contributed to students' understanding of the academic research process
- Guided students in data annotation, coding of machine learning algorithms, experimental design and result dissemination

Supervised Teaching

Jan 2019 – May 2019

University of Florida

Gainesville, FL

- Supervised taught over 25 students in undergraduate-level machine learning course
- Provided lectures on normalization techniques, Random Forests, Kernels and Support Vector Machines
- Lead test review sessions and provided weekly office hours

Supervised Teaching

Aug 2018 – Dec 2018

University of Florida

Gainesville, FL

- Supervised taught over **180 students in graduate-level machine learning course**
- Provided lectures on Linear Discriminant Analysis and backpropagation in artificial neural networks
- Wrote custom Python scripts to aid with grading homework and tests
- Managed git repository for class assignment submissions

Vice President of Scholarship

May 2014 – Dec 2014

Sigma Phi Epsilon Fraternity

Rolla, MO

- Developed and implemented Sigma Accelerator Academic Program
- Managed academic support system
- Created 12 practice tests in Calculus I, Calculus II, Trigonometry, College Algebra, and Chemistry
- Lead practice tests, reviews, and tutoring sessions for new members
- Guided fraternity to place first in grades among 22 fraternities and sororities
- Contributed to winning the highest award from Sigma Phi Epsilon Nationals

HONORS AND AWARDS

Wilson and Marie Collins Endowment for Graduate Fellowship

Fall 2019

Merit based scholarship to support graduate studies at the University of Florida

Graduate Student of the Week

Fall 2018

Recognition by University of Florida for academic achievements

Graduate School Preeminence Award

Fall 2017

Merit based scholarship to support graduate studies at the University of Florida

PUBLICATIONS

Published or Under Review

- S. K. Meerdink, J. Bocinsky, A. Zare, N. Kroeger, **C. H. McCurley**, D. Shats and P. D. Gader. “**Multi-Target Multiple Instance Learning for Hyperspectral Target Detection**,” in *IEEE TGRS*, Under Review (Minor Revision).
- J. Peeples, S. Walker, **C. H. McCurley**, A. Zare and J. Keller. “**Divergence Regulated Encoder Network for Joint Dimensionality Reduction and Classification**,” in *2021 IEEE International Conference on Image Processing (ICIP)*. Under Review.
- S. Meerdink, J. Bocinsky, E. Wetherley, A. Zare, **C. H. McCurley**, and P. Gader. “**Developing spectral libraries using Multiple Target Multiple Instance Adaptive Cosine/Coherence Estimator**,” *10th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS)*, pp. 1-5, Sept. 2019.
- **C. H. McCurley**, J. Bocinsky, A. Zare. “**Comparison of Hand-held WEMI Target Detection Algorithms**,” in *Proc. SPIE 11012, Detection and Sensing of Mines, Explosive Objects, and Obscured Targets XXIV*, 2019.
- J. Bocinsky, **C. H. McCurley**, D. Shats and A. Zare. “**Investigation of Initialization Strategies for the Multiple Instance Adaptive Cosine Estimator**,” in *Proc. SPIE 11012, Detection and Sensing of Mines, Explosive Objects, and Obscured Targets XXIV*, 2019.

In Preparation

- S. Zou, **C. H. McCurley**, A. Zare and P. Gader, “**A Review of Learning from Weak and Imprecise Labels**.” (In prep.)
- **C. H. McCurley**, A. Stevens, I. Perlmutter, S. Myers and A. Zare, “**Multiple Instance Triplet Embedding Network**.” (In prep.)
- **C. H. McCurley**, D. Rodriguez, C. Trousdale, A. Baldino, E. Li and A. Zare, “**Learning Weakly-Supervised Pixel-Level Segmentation from Bag-Level Classifiers**.” (In prep.)

CONFERENCES AND PRESENTATIONS

Oral Presentations

- Oral Presentation. “**Comparison of Hand-held WEMI Target Detection Algorithms**,” *International Society for Optics and Photonics (SPIE) Defense + Commercial Sensing Conference*, Baltimore, MD, April 2019.
- Oral Presentation. “**Student of the Week: Machine Learning and Sensing Lab**,” ECE GSO General Body Meeting, University of Florida, October 2018.
- Oral Presentation. “**Electromagnetic Induction (EMI) Analysis**,” Institute for Defense Analyses (IDA), Alexandria, VA, August 2018.

Poster Presentations

- Poster Presentation. S. Zou, **C. H. McCurley**, A. Zare, C. Jiao, S. Meerdink, J. Bocinsky, N. Kroeger and P. Gader. “**Target Detection Given Uncertain Training Data**,” *Warren B. Nelms Annual IoT Conference*, Gainesville, FL, Dec. 2019.

PROFESSIONAL EXPERIENCE

System Protection and Controls Engineering Intern

May 2016 – Aug 2016

Oklahoma Gas & Electric

Oklahoma City, OK

- Completed over 20 System Protection designs to be implemented in the field
- Experience with protective relaying, breakers, load tap changers, integrated volt-VAR controllers, and other power circuit protection technologies
- Responsible for interpreting and drafting CAD drawings of protection and control schematics
- Aided in design and calculations regarding solar shading, inverters, panels, layout, and land selection for 25 MW solar farm
- Connected SCADA communication network for remote access to protective equipment
- Utilized strong communication skills for final project presentation to executives and co-workers
- Adhered to OG&E, federal, and international standards for safety practices
- Managed multiple projects with shifting priorities

Distribution Engineering Intern

May 2015 – Aug 2015

Oklahoma Gas & Electric

Oklahoma City, OK

- Completed over 15 distribution designs totaling \$690,000
- Experience in identification and selection of components to meet desired goals
- Determined distribution designs based on cost, reliability, and maintainability
- Produced work in a timely manner
- Utilized communication and teamwork skills when collaborating with fellow employees
- Gathered on-site measurements which were used to supply recommended designs
- Worked closely with senior engineers and technicians
- Utilized OG&E's computer-based design software to produce detailed distribution designs
- Met with customers to discuss their needs and design possibilities
- Participated and gave input in the Technology Development and Implementation Team
- Demonstrated adherence to company practices, policies, and procedures
- Completed final project presentation to co-workers and executives

COMPUTER SKILLS

Languages: Python, PyTorch, Matlab

Software: Git

Systems: Windows, Mac OS, Linux

SERVICE

GatorTRAX

Tau Beta Pi Honor Society

- Weekly youth mentor promoting STEM participation and outreach

Jan 2018 – May 2019

Gainesville, FL

REFERENCES

Alina Zare, Prof. of Electrical and Computer Eng.

University of Florida, Gainesville, FL | 352-273-2604 | azare@ece.ufl.edu

Paul Gader, Prof. of Computer & Information Science & Eng. | Sustainable Infrastructure & Environmental Eng.

University of Florida, Gainesville, FL | 352-294-1629 | paul.gader@essie.ufl.edu

Joseph Wilson, Prof. of Computer & Information Science & Eng.

University of Florida, Gainesville, FL | 352-392-6678 | jnw@cise.ufl.edu