Joshua Peeples

PhD Candidate · Electrical and Computer Engineering

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Education

University of Florida *Gainesville, FL*

PhD Electrical and Computer Engineering *June 2017 - Pres.*

- Advisor: Dr. Alina Zare
- Thesis: "Connecting the Past and Present: Histogram Layers for Texture Analysis"
- Research Interest: Machine Learning, Deep Learning, Pattern Recognition, Computer Vision, Image Processing
- Expected Graduation Date: April 2022

University of Florida *Gainesville, FL*

MS Electrical and Computer Engineering *June 2017 - Dec 2019*

- Related Coursework: Fundamentals of Machine Intelligence, Math for Intelligent Systems, Machine Learning, Foundations of Digital Signal Processing, Image Processing and Computer Vision

University of Alabama at Birmingham *Birmingham, AL*

BS Electrical Engineering (Minor: Mathematics) *Aug 2013 - April 2017*

- Magna Cum Laude

Professional Experience

Naval Research Enterprise Internship Program *Panama City, FL*

Graduate Summer Research Intern (Virtual) *May 2021 - Pres.*

- Project: "Deep, Regularized Histogram-based Features for Seafloor Segmentation and Classification"
- Assisted in curation of ground truth labels for semantic segmentation of circular synthetic aperture sonar (CSAS) imagery
- Develop algorithms to identify various environments in synthetic aperture sonar (SAS) imagery

University of Florida Machine Learning and Sensing Laboratory *Gainesville, FL*

Graduate Research Assistant *June 2017 - Pres.*

- Developed automated machine learning approaches for seafloor segmentation and scene understanding
- Designed and implemented novel deep learning layers focused on texture analysis
- Supervised undergraduate students on research projects
- Disseminated results of research through publications, presentations, and reports to funding agencies

Michigan State University Summer Research Opportunities Program *East Lansing, MI*

Undergraduate Summer Research Intern *May 2016 - July 2016*

- Participated in a 10-wk residential program for students interested in graduate study
- Attended a week-long short course in statistics and R Studio software
- Utilized multiple datasets to develop an improved algorithm for lane detection
- Selected for travel award to present research at Emerging Researchers National Conference in STEM

University of Alabama at Birmingham Signal Processing and Embedded Systems Laboratory *Birmingham, AL*

Undergraduate Research Assistant *Jan 2014 - Dec 2016*

- Performed image processing techniques for a project that involved topics such as facial detection and recognition
- Worked with Arduino software that was implemented to various technologies such as a robotic arm, sensors, and Bluetooth
- Designed and interpreted circuit diagrams to properly implement hardware designs

Publications

Published

5. Prioleau, D., Alikhademi, A., Roberts, A., **Peeples, J.**, Zare, A., Gilbert, J.E. 2021. "Use of Divisive Clustering for Reducing Bias in Training Data," in International Conference on Machine Learning and Data Mining in Pattern Recognition.
4. Walker, S., **Peeples, J.**, Dale, J., Zare, A., Keller, J. 2021. "Explainable Systematic Analysis for Synthetic Aperture Sonar Imagery," in IEEE International Geoscience and Remote Sensing Symposium.
3. **Peeples, J.**, Cook, M., Suen, D., Zare, A., Keller, J. 2019. "Comparison of Possibilistic Fuzzy Local Information C-Means and Possiblisitic K-Nearest Neighbors for Synthetic Aperture Sonar Segmentation," in Proc. SPIE 11012, Detection and Sensing of Mines, Explosive Objects, and Obscured Targets XXIV.
2. Starke, A., McNair, J., Trevizan, R., Bretas, A., **Peeples, J.**, Zare, A. 2018. "Toward Resilient Smart Grid Communications using Distributed SDN with ML-Based Anomaly Detection," in 16th International Conference on Wired & Wireless Internet Communications.
1. **Peeples, J.**, Suen, D., Zare, A., Keller, J. 2018. "Possibilistic Fuzzy Local Information C-means with Automated Feature selection for Seafloor Segmentation," in Proc. SPIE 10628, Detection and Sensing of Mines, Explosive Objects, and Obscured Targets XXIII.

In Review

3. Gloaguen, R., Brym, Z., **Peeples, J.**, Xu, W., Hyen-Chung, C., Rowland, D. 2021. "The Plasticity of Early Root Development in Sesamum indicum L. as Influenced by Genotype and Water Availability."
2. **Peeples, J.**, Walker, S., McCurley, C., Zare, A., Keller, J. 2021. "Divergence Regulated Encoder Network for Joint Dimensionality Reduction and Classification."
1. **Peeples, J.**, Xu, W., Zare, A. 2020. "Histogram Layers for Texture Analysis."

Awards, Fellowships, & Grants

Grand total: $525,910 **Undergraduate total**: $30,000 **Graduate total**: $495,910

University of Alabama at Birmingham (UAB); University of Florida (UF)

2021	**Inductee**, Edward Alexander Bouchet Graduate Honor Society	
2020-21	**Dr. Joseph S. Rosko Award**, UF Department of Electrical and Computer Engineering	*$ 3,750*
2018-Pres.	**Graduate Research Fellowship (NSFGRFP)**, National Science Foundation	*$ 144,000*
2018-Pres.	**NSF External Top-up Award**, UF Graduate School	*$ 26,250*
2018-Pres.	**Southern Regional Education Board Institute Travel Award**, UF Graduate School	*$ 6,000*
2017-Pres.	**McKnight Doctoral Fellowship**, Florida Education Fund	*$ 85,000*
2017-Pres.	**Preeminence Award**, UF Graduate School	*$ 218,130*
2017	**Iva and Norman Tucker Fellowship**, UF Transportation Institute	*$ 4,000*
2017	**Board of Education Summer Fellowship**, UF Office of Graduate Diversity Initiatives	*$ 8,780*
2017	**Green Blazer of Excellence**, UAB Blazer Male Excellence Network	
2017	**President's List (Spring)**, UAB	
2016-17	**Dupuis Leadership Scholarship**, UAB School of Engineering	*$ 1,500*
2016-17	**Cleo and Clara Thomas Academic Scholarship for Excellence**, UAB	*$ 1,000*
2016	**Commitment to Excellence in Tutoring**, UAB Vulcan Material Academic Success Center	
2016	**Dean's List (Spring)**, UAB	
2016	**President's List (Fall)**, UAB	
2016	**Honor Scholar**, UAB Multicultural Scholars Program	
2015	**Dean's List (Spring and Fall)**, UAB	
2015	**Scholar of the Year**, UAB Multicultural Scholars Program	
2014	**Dean's List (Spring)**, UAB	

2013-17	**Vulcan Materials Scholarship**, UAB	*$ 4,000*
2013-17	**Comprehensive Minority Faculty and Student Development Program Scholarship**, UAB	*$ 4,000*
2013-17	**Collegiate Honors Scholarship**, UAB	*$ 16,000*
2013-14	**Scholarship**, The Birmingham Chapter of the American Association of Blacks in Energy	*$ 3,500*

Presentations

** presenting author*

Invited Talks

3. ***Peeples, J.** 2021. Connecting the Past and Present: Histogram Layers for Texture Analysis. Boston University Electrical and Computer Engineering Seminar Series, Boston, MA, Virtual.
2. ***Peeples, J.** 2021. Artificial Intelligence for Texture Analysis. University of Florida Thompson Earth Systems Institute Scientist in Every Florida School, Gainesville, FL, Virtual.
1. ***Peeples, J.** 2020. University of Alabama at Birmingham Engineering Young Alumni Series. Design Your Engineering Career, Birmingham, AL, Virtual.

Oral Presentations

8. *Prioleau, D., *Alikhademi, A., Roberts, A., **Peeples, J.**, Zare, A., Gilbert, J.E. 2021. Use of Divisive Clustering for Reducing Bias in Training Data. International Conference on Machine Learning and Data Mining in Pattern Recognition, New York City, New York, Virtual.
7. Walker, S., ***Peeples, J.**, Dale, J., Zare, A., Keller, J. 2021. Explainable Systematic Analysis for Synthetic Aperture Sonar Imagery. IEEE International Geoscience and Remote Sensing Symposium, Brussels, Belgium, Virtual.
6. ***Peeples, J.**, *Jameson, J., Kotta, N., Stoppel, W., Zare, A. 2021. Jointly Optimized Spatial Histogram U-NET Architecture (JOSHUA) for Adipose Tissue Identification in Histological Images of Lyophilized Silk Sponge Implants. University of Florida Biomaterials Day, Gainesville, FL.
5. *Gloaguen, R.M., **Peeples, J.**, Xu, W., Brym, Z.T., Rowland, D.L., Zare, A., Chun, H.C. 2020. New Approaches to Characterize the Root System Architecture Response of a Drought Tolerant Crop to Varying Soil Moisture Levels. ASA-CSSA-SSSA Annual Meeting, Nov. 9-13, C02 Crop Physiology and Metabolism Section, C-2 Graduate Student Oral, Virtual.
4. ***Peeples, J.**, Cook, M., Suen, D., Zare, A., Keller, J. 2019. Comparison of Possibilistic Fuzzy Local Information C-Means and Possibilistic K-Nearest Neighbors for Synthetic Aperture Sonar Image Segmentation. Society for Optics and Photonics Defense + Commercial Sensing, Baltimore, MD.
3. ***Peeples, J.** 2019. Histogram Layer: A Novel Approach to Feature Engineering. McKnight Doctoral Mid-Year Research and Writing Conference, Tampa, FL.
2. ***Peeples, J.**, Suen, D., Zare, A., Keller, J. 2018. Possibilistic Fuzzy Local Information C-Means with Automated Feature Selection for Seafloor Segmentation. Society for Optics and Photonics Defense + Commercial Sensing, Orlando, FL.
1. ***Peeples, J.**, Zare, A. 2018. Synthetic Aperture SONAR Soft Segmentation using Possibilistic Fuzzy Local Information C-Means. University of Florida Water Institute Symposium, Gainesville, FL.

Poster Presentations

2. ***Peeples, J.**, Driggers, B., Contreras, G., Tracht, N., Chen, S., Bedwell, M. 2017. Using the Engineering Force: BHAMSolo Senior Design Project. University of Alabama at Birmingham Spring Expo, Birmingham, AL.
1. ***Peeples, J.**, Al-Qizwini, M., Radha, H. 2017. LIVE ON: Lane, Sign, and Vehicle Detection in Various Environments," Emerging Researchers National Conference in STEM, Washington, D.C.

Teaching Experience

University of Florida Electrical and Computer Engineering Department *Gainesville, FL*

Supervised Teacher, EEL 5840/4930 Fundamentals of Machine Learning *Aug 2019 - Dec 2019*

- Updated lecture notes and held weekly office hours
- Assisted in the preparation and grading of assignments and exams
- Participated in weekly meetings with instructor team

Successful Transition and Enhanced Preparation for Undergraduates Program *Gainesville, FL*

Course Co-Instructor, Introduction to Coding and Programming *July 2019 - Aug 2019*

- Led lectures to introduce core concepts for programming and Python to incoming engineering students
- Developed course syllabus, assignments, and project

Successful Transition and Enhanced Preparation for Undergraduates Program *Gainesville, FL*

Course Co-Instructor, Machine Learning *July 2018 - Aug 2018*

- Led lectures to introduce machine learning and remote sensing to incoming engineering students
- Coordinated activities of class with program director and trained teaching assistants in preparation of course

University of Alabama at Birmingham Vulcan Material Academic Success Center *Birmingham, AL*

Supplemental Instruction Leader, Calculus based Physics II *Jan 2015 - April 2015*

- Created an intensive learning environment for undergraduate students by hosting two weekly SI sessions (75 minutes per session)
- Constructed weekly worksheets and mock exams to prepare students for class
- Maintained a constant interaction with the professor to properly align supplemental materials with course information and requirements

University of Alabama at Birmingham Vulcan Material Academic Success Center *Birmingham, AL*

Tutor, Electrical circuits, Mathematics, and Physics *Aug 2014 - April 2017*

- Assisted students in difficult subjects by working through conceptual and quantitative problems
- Led approximately 10 one-hour sessions per week with undergraduates
- Participated in training sessions to become an Associate in the Tutoring Profession (ATP) certified Associate Tutor

Mentoring

2020-21 **Wilkerson, P.**, UAB Young Alumni Mentee, University of Alabama Birmingham,
Achievements: internship for Spring 2021 with TriAltus Bioscience, graduated Spring 2021

2019-21 **Walker, S.**, Undergraduate Research Assistant, University of Florida,
Achievements: Selected for University Research Scholar Program, graduated Spring 2021

2019-20 **Zhao, H.**, Undergraduate Research Assistant, University of Florida,
Achievements: Graduated Fall 2020

2019 **Tran, T.**, Graduate Research Assistant (Master's student), University of Florida,
Achievements: Graduated Fall 2020

2019 **Kim, T.**, Student Science Training Program (High School student), University of Florida,
Achievements: won Best Paper Award, accepted into Columbia University

Outreach & Professional Development

Professional Service and Outreach

University of Florida Bouchet Spring Symposium *Gainesville, FL*

Co-Organizer *March 2021 - April 2021*

- Coordinated with team to organize theme and events for symposium
- Served on "Beyond a Scholar" panel to share research experience and journey
- Co-hosted research presentation session (Lightning Talks)

University of Alabama at Birmingham School of Engineering Young Alumni Mentorship Program *Birmingham, AL*

Mentor *July 2020 - Pres.*

- Provided academic guidance, career advice and personal development to current UAB student(s)
- Maintained regular contact with mentee through two monthly, virtual meetings
- Documented interactions with mentee and provide feedback to Program Manager and Alumni Advisory Board

University of Florida Board of Education Summer Fellowship Program *Gainesville, FL*

Peer Advisor *July 2020 - Aug 2020*

- Served as mentor for incoming underrepresented graduate students
- Assisted in planning and leading program events with other Peer Advisors and Program Coordinator
- Led group of seven engineering students and documented their progress through weekly reports

University of Florida Student Science Training Program (SSTP) *Gainesville, FL*

Mentor *June 2019 - July 2019*

- Developed research project for high school student participant
- Assisted and provided feedback for program deliverables (paper, poster, and presentation)
- Served as primary mentor for the participant which culminated in the student earning the SSTP Best Paper Award

McKnight Doctoral Mid-Year Research and Writing Conference *Tampa, FL*

Computer Science Panel Chair *June 2018 - Feb 2019*

- Recruited panelists to present their research during discipline-specific session
- Moderated discussion and feedback on presentations from expert discussants
- Collected and documented feedback on the session from panelists and audience to share with conference team

Leadership Experience

African/African American/African Diaspora in Electrical and Computer Engineering *Gainesville, FL*

President *Aug 2020 - Pres.*

- Led organization that provides community and support for Black undergraduate and graduate students in the department
- Facilitated monthly executive board meetings and allocate duties among officers

Machine Learning and Sensing Laboratory *Gainesville, FL*

Social Media Manager *Aug 2020 - Pres.*

- Maintained and created content for the lab's Twitter and Facebook accounts to raise awareness of research and outreach activities

Machine Learning and Sensing Laboratory *Gainesville, FL*

Outreach Coordinator *Aug 2019 - July 2020*

- Created and organized opportunities to share the lab's research with others in the community (i.e., laboratory tours)

Electrical and Computer Engineering Graduate Student Organization *Gainesville, FL*

Secretary *April 2019 - April 2020*

- Recorded meeting notes and oversaw calendar of events
- Maintained listserv and reserved spaces for all activities of the organization

Gator McKnights Unite *Gainesville, FL*

President *April 2018 - April 2019*

- Led graduate student organization responsible for providing personal and professional development opportunities for African American and Latinx graduate students
- Organized monthly executive board meetings and regulate the general functioning of the executive board and organization

Electrical and Computer Engineering Graduate Student Organization *Gainesville, FL*

Faculty and Staff Liason *Jan 2018 - April 2018*

- Chaired social events to promote community in the ECE department (*e.g.*, faculty/staff mixer)

Machine Learning and Sensing Laboratory *Gainesville, FL*

Departmental Representative *Aug 2017 - June 2019*

- Served as liaison between the department and lab by actively participating in departmental events

University of Alabama at Birmingham Institute of Electrical and Electronics Engineers *Birmingham, AL*

Vice Chair *June 2016 - April 2017*

- Assisted the Chapter Chair in following up on assigned committee responsibilities
- Performed all functions of the Chapter Chair in their absence or upon request

University of Alabama at Birmingham School of Engineering *Birmingham, AL*

Leadership Scholar *June 2016 - April 2017*

- Led tours of the engineering building for prospective students
- Actively participated in several events throughout the year such as recruitment, award ceremonies, and meetings

University of Alabama at Birmingham Multicultural Scholars Program *Birmingham, AL*

President *Aug 2014 - April 2017*

- Coordinated activities of the executive committee, which included oversight of the duties of executive committee members
- Served as the liaison between the executive body and program director
- Assisted students in identifying funding opportunities as co-Chair of the scholarship committee

University of Alabama at Birmingham Blazer Male Excellence Network *Birmingham, AL*

Mentor *Aug 2014 - April 2017*

- Served as a role model, counselor, and motivator for incoming freshmen Black male students
- Collaborated with other mentors for social and volunteer activities of organization

Conference and Journal Peer Review

Geoscience and Remote Sensing Letters (Spring 2019, Spring 2020, Summer 2020)

Professional Memberships

2018-Pres.	Association for Computing Machinery (ACM)
2017-Pres.	National Society of Black Engineers (NSBE)
2017-Pres.	Order of the Engineer
2016-Pres.	Institute of Electrical and Electronics Engineers (IEEE)
2015-Pres.	National Society of Leadership and Success (NSLS)