Shengting Cao, Ph.D.

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Employment History

2019 – Now
- **Research Assistant.** Electrical Computer Engineering Department, University of Alabama, Tuscaloosa AL
- **Teaching Assistant.** Electrical Computer Engineering Department, University of Alabama, Tuscaloosa AL

2018 – 2019
- **Research Intern.** Mercedes-Benz U.S. International, Vance AL.
  Front End iOS Developer Intern. Gongbing Technology, Shenzhen, China.

2017 – 2019
- **ENGenuity Lab Computer Science Tutor.** College of Engineering. The University of Alabama. Tuscaloosa AL

Education

2019 – Now
- **Ph.D., Electrical Computer Engineering, The University of Alabama**
  Thesis Title (tentative): *Generative AI for Mixreality and Metaverse prototype*

2016 – 2019
- **B.Sc. Computer Science, The University of Alabama**
  Minor: *Advertising*

Research Publications

Patents

1. F. Hu, Y. Gan, **S. Cao**, and W. Xuefeng, "Real-time, fine-resolution human intra-gait pattern recognition based on deep learning models," Worldwide applications US17749754, Filed on May 20, 2022.Available at https://patents.google.com/patent/US20230040650A1/en, 2023.
2. D. Brown, C.-Y. Li, Mansoo, **S. Cao**, X. Wang, F. Hu, Y. Gan, and L. Zhang, "Simulating a split-belt with a single-belt treadmill," Worldwide applications US17498986, Filed on October 12, 2021. Available at https://patents.google.com/patent/US20220111249A1/en, 2022.

Journal Articles

1. **S. Cao**, J. Zhao, F. H. Hu, and Y. Gan, "Metaverse-oriented telerehabilitation with single-camera-based, avatar-free rendering," *IEEE Transactions on Visualization and Computer Graphics*, Under review.
2. J. Gong, **S. Cao**, S. Korivand, and J. Nader, "Reconstructing human gaze behavior from eeg using inverse reinforcement learning," *Smart Health*, Under review.
3. **S. Cao**, M. Ko, C.-Y. Li, D. Brown, X. Wang, F. Hu, and Y. Gan, "Single-belt versus split-belt: Intelligent treadmill control via microphase gait capture for poststroke rehabilitation," *IEEE Transactions on Human-Machine Systems*, vol. 53, no. 6, pp. 1006–1016, 2023. DOI: 10.1109/THMS.2023.3327661.
4. X. Li, **S. Cao**, H. Liu, X. Yao, B. C. Brott, S. H. Litovsky, X. Song, Y. Ling, and Y. Gan, "Multi-scale reconstruction of undersampled spectral-spatial oct data for coronary imaging using deep learning," *IEEE Transactions on Biomedical Engineering*, vol. 69, no. 12, pp. 3667–3677, 2022. DOI: 10.1109/TBME.2022.3175670.
5. H. Liu, **S. Cao**, Y. Ling, and Y. Gan, "Inpainting for saturation artifacts in optical coherence tomography using dictionary-based sparse representation," *IEEE Photonics Journal*, vol. 13, no. 2, pp. 1–10, 2021. DOI: 10.1109/JPHOT.2021.3056574.

6. X. Chen, A. Miller, **S. Cao**, Y. Gan, J. Zhang, Q. He, R.-Q. Wang, X. Yong, P. Qin, B. H. Lapizco-Encinas, and K. Du, "Rapid escherichia coli trapping and retrieval from bodily fluids via a three-dimensional bead-stacked nanodevice," *ACS Applied Materials & Interfaces*, vol. 12, no. 7, pp. 7888–7896, 2020, PMID: 31939648. DOI: 10.1021/acsami.9b19311. eprint: https://doi.org/10.1021/acsami.9b19311.

7. M. V. Fedewa, K. Sullivan, C. J. Holmes, B. Hornikel, **S. Cao**, Y. Gan, and M. R. Esco, "Test-retest reliability of total body volume derived from a single 2-dimensional digital image: 3196 board# 17 may 29 1: 30 pm-3: 00 pm," *Medicine & Science in Sports & Exercise*, vol. 52, no. 7S, p. 869, 2020.

8. K. Sullivan, C. J. Holmes, B. Hornikel, **S. Cao**, Y. Gan, M. R. Esco, and M. V. Fedewa, "Validity of a 3-compartment body composition model derived from a single 2-dimensional digital image: 3199 board# 20 may 29 1: 30 pm-3: 00 pm," *Medicine & Science in Sports & Exercise*, vol. 52, no. 7S, p. 870, 2020.

Conference Inproceedings

1. X. Wu, **S. Cao**, H. Y. Lee, and J. Gong, "Let every voice be heard: Developing a cost-effective community sampling frame in rural alabama to combat covid-19 (poster)," in *2022 IEEE/ACM Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE)*, 2022, pp. 174–175.

2. **S. Cao**, X. Yao, N. Koirala, B. Brott, S. Litovsky, Y. Ling, and Y. Gan, "Super-resolution technology to simultaneously improve optical & digital resolution of optical coherence tomography via deep learning," in *2020 42nd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, 2020, pp. 1879–1882. DOI: 10.1109/EMBC44109.2020.9175777.

Teaching

ECE

- **509/409: Communication Labs for graduate and undergraduate student**
  Course duty: *Instruct students to familiarize with MTLAB build-in functions and model multi-path propagation, modulation, and signal constellations for communication system*
- **380: Digital Logic**
  Course duty: *Instruct students to familiar with fundamental concepts of digital design including standard IC design and FPGA with VHDL language.*
- **492/494: Capstone Design I/II**
  Course duty: *Instruct senior design group to propose research problem and prototype solutions. Meet with students once per week to discuss implementation details and make sure to finish milestone objectives*

CS

- **201: Data Structures and Algorithems**
  Course duty: *Help student understand and code algorithms concepts such as Divide-and-Conquer, Sorting algorithm, HashTables, Dynamic Programming, Greedy algorithms, Graphs algorithms, etc.*
- **100: Computer Science I for Majors**
  Course duty: *Help student familiar with C compiler and programming concepts such as loops, function recursion, sorting, etc.*
- **101: Computer Science II for Majors**
  Course duty: *Help students familiar with C++ compiler and understanding algorithmic complexity, data structure, object-oriented programming, etc.*
- **Datascience summer bootcamp**
  Course duty: *Help students familiar with RapidMiner and use it to process CSV files and apply machine learning algorithms such as SVM, RandomForest, etc.*

Skills

Coding	Python, MATLAB, C/C++, Javascript, C#
Generative AI	PyTorch, Tensorflow, CUDA, Generative Adversarial Network, Variational Autoencoder, Neural Radiance Field, Stable Diffusion, Inverse Reinforcement Learning
Game & XR	Android Studio, Visual Studio, Unity, OpenXR
Datascience	Pandas, RapidMiner, Scikit-Learn, MySQL, SQLite, Jupyter Notebook
Web & Cloud	Google Cloud, AWS, Azure Cloud, Tencent Cloud, Baidu AI Cloud, Flask, Hugo, HTML
IoT & Security	Linux, ScadaBR, Ladder Logic, Aduino Uno, Raspberry Pi, VHDL
Version Control	Git, Bitbucket, HuggingFace

Miscellaneous Experience

Awards and Achievements

2020 — **1st place in the Google Earth Engine Challenge at the Machine Learning for Science Hackathon Competition**, Awarded by Alabama Cyber Initiative of the University of Alabama and Data Science Initiative of Brown University

Community Services

2023 — **ACSSUA President**. Hosted Mid-Autumn festival events and Spring festival events for Chinese students and faculties. ACSSUA refers to the Association of Chinese Students and Scholars at the University of Alabama. Find in: `https://mysource.ua.edu/`

AAPI Volunteer. Helped Asian American and Pacific Islander organizations launch events. About AAPI: `https://aapi.ua.edu/about-us/`

2020 — **ACSSUA Vice President.** Free mask and hand sanitizer distribution during the COVID-19 pandemic for the Chinese community in the Tuscaloosa area.

MATHCOUNTS West Alabama Reginal Competition Volunteer, Show high school student the 3D optical scanning of fingerprint and VR demostration

2017 – 2021 — **ACSSUA Social Media Ambassador.** Designed poster and created a social media connection to Chinese students at the University of Alabama

ACSSUA Spring Festival Event Volunteer. Helped ACSS organization events each year

2016 — **Al's Pals Volunteer Mentor.** Taught 1st-grade students English and Math once per week in Matthews Elementary School.

Certificaitons

2020 — **NSF Innovation Corps Program Certification**. Issued by National Science Foundation

Reviwer

2021 – 2023 — **International Journal of Telemedicine and Application**

References

Available on Request