

## EDUCATION

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- Georgia Institute of Technology** Atlanta, GA  
PhD in Machine Learning — Advisor: [Justin Romberg](#) Aug 2020–Present
- Focus in manifold optimization, compressed sensing, and low-rank approximation
  - Constructing an end-to-end radar simulator incorporating circuit and digital nonlinear effects
- Georgia Institute of Technology** Atlanta, GA  
M.S. in Electrical Engineering, GPA: 4.0/4.0 Jan 2018–Dec 2018
- Concentration in digital signal processing with a graduate research assistantship
- Georgia Institute of Technology** Atlanta, GA  
B.S. in Electrical Engineering, GPA: 4.0/4.0 Aug 2014–Dec 2017
- Undergraduate research in optics and generative machine learning models for music

## EXPERIENCE

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- Georgia Tech Research Institute** Atlanta, GA  
Research Engineer at the Advanced Concepts Lab Jan 2019–May 2023
- Led software development on a \$22M project, creating code from hardware drivers to UI
  - Wrote algorithms in C++/Python to analyze electrodynamic interactions of molecules
  - Designed a distributed job scheduler for optimizing machine learning architectures
- XONE Technology** Santa Clara, CA  
Embedded Software Engineer Apr 2018–Aug 2018
- Developed VHDL and MATLAB for a product that uses Wi-Fi for location tracking
  - Coded C++ serial device drivers for attitude and heading reference systems

## SELECTED PUBLICATIONS

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See more on [Google Scholar](#)

1. **A. Saad-Falcon**, C. Howard, J. Romberg, and K. Allen, “Level set methods for gradient-free optimization of metasurface arrays,” *Scientific Reports*, vol. 14, no. 1, p. 16674, Jul. 2024, doi: [10.1038/s41598-024-67142-2](https://doi.org/10.1038/s41598-024-67142-2).
2. **A. Saad-Falcon**, B. Ancelin, and J. Romberg, “Subspace Tracking with Dynamical Models on the Grassmannian,” in *2024 IEEE 13rd Sensor Array and Multichannel Signal Processing Workshop (SAM)*, Corvallis, OR, USA: IEEE, Jul. 2024, pp. 1–5. doi: [10.1109/SAM60225.2024.10636434](https://doi.org/10.1109/SAM60225.2024.10636434).
3. **A. Saad-Falcon et al.**, “Applying an electrostatic cross-correlation to the CFTR-ATP interaction,” Apr. 2024, arXiv. doi: [10.48550/ARXIV.2404.09281](https://doi.org/10.48550/ARXIV.2404.09281).
4. **A. Saad-Falcon**, Z. Zhang, D. Ryoo, J. Dee, R. S. Westafer, and J. C. Gumbart, “Extraction of Dielectric Permittivity from Atomistic Molecular Dynamics Simulations and Microwave Measurements,” *J. Phys. Chem. B*, vol. 126, no. 40, pp. 8021–8029, Oct. 2022, doi: [10.1021/acs.jpcc.2c05260](https://doi.org/10.1021/acs.jpcc.2c05260).

5. **A. Saad-Falcon** *et al.*, “Abstraction and Acceleration of Tensor Processing for Element-Level Digital Arrays,” in 2022 IEEE International Symposium on Phased Array Systems & Technology (PAST), Waltham, MA, USA: IEEE, Oct. 2022, pp. 01–08. doi: [10.1109/PAST49659.2022.9974995](https://doi.org/10.1109/PAST49659.2022.9974995).
6. B. Ancelin, **A. Saad-Falcon**, and J. Romberg, “Rapid Grassmannian Averaging with Chebyshev Polynomials,” Oct. 2024, arXiv. doi: [10.48550/ARXIV.2410.08956](https://doi.org/10.48550/ARXIV.2410.08956).
7. B. Ancelin, ..., **A. Saad-Falcon**, et al., “MANGO: Disentangled Image Transformation Manifolds with Grouped Operators,” Sep. 2024, arXiv. doi: [10.48550/ARXIV.2409.09542](https://doi.org/10.48550/ARXIV.2409.09542).

## PROJECTS

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See more on my [website](#) and [GitHub](#)

- **VaseGen** (Python, 2020)
  - Using GANs to reconstruct ancient vases
- **BinBot** (Python, 2020, private)
  - Trading algorithm backtesting and paper/live deployment
- **Witness Protection** (Python, 2018)
  - Applying face swap to protect witnesses in a live video
- **MATLAB Particles** (MATLAB, 2014)
  - Particle simulation under different force fields

## SKILLS

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- **Programming:** Python, MATLAB, C/C++, VHDL, Java
- **AI/ML:** PyTorch, TensorFlow, Keras, Scikit-Learn, Pandas
- **Development:** Git, CI/CD, Kubernetes, Docker, AWS, Azure
- **Technical Tools:** Makefile, RPM, LaTeX
- **Web:** HTML/CSS, JavaScript, Flask

## AWARDS

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- Best Poster Award – **CogniSense** Annual Review 2024
- Best Poster Award – **ML@GT Student Conference** 2024
- Molecular Generation with Machine Learning (MOLGEN) – \$115k in internal research funding 2019–2023
- Principal Investigator – **DARPA TRIAD** (Tensors for Reprogrammable Intelligent Array Demonstrations) 2021–2022
- Graduate Research Assistant Award – given to 1 out of 200 research assistants 2018
- **FinTech Hackathon** Runner-Up – wireless close-range secure payment system 2017
- **HackGSU Hackathon** Finalist – virtual drumset using augmented reality and microcontrollers 2017
- **Stamps President’s Scholarship** – 50 out of ~13,000 early action applicants 2014–2018

## LEADERSHIP

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- Freelance Private Tutoring Jun 2020–Jun 2023  
*Ran private tutoring agency with eight concurrent students in multiple subjects*
- Molecular Dynamics/Hardware Co-op Manager at the Georgia Tech Research Institute May 2020–May 2023  
*Directed co-op students in molecular dynamics simulations and radio frequency hardware*
- MOLGEN Co-op Manager at the Georgia Tech Research Institute Jan 2020–May 2023  
*Developed an ML crash course for multiple students and jointly created a codebase and paper*
- **Stamps President’s Scholarship** Freshman Hosting and Mentoring Feb 2015–Mar 2017  
*Hosted scholarship candidates every year and provided freshman/sophomore mentorship*