

Alex Saad-Falcon

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EXPERIENCE

GEORGIA TECH PHD STUDENT

August 2020 – Present | Atlanta, GA

- Focus in manifold optimization, compressed sensing, and electromagnetics
- Constructing an end-to-end radar simulator with real-world distortions
- Developing novel algorithms for antenna signal processing and estimation
- Applying machine learning to RF modeling, design, and control problems

GEORGIA TECH RESEARCH INSTITUTE RESEARCH ENGINEER

January 2018 – May 2023 | Atlanta, GA

- Software lead on a \$22m project creating an RF interference mitigation system
- Wrote algorithms to analyze electrodynamic interactions of molecules
- Designed a distributed job scheduler for optimizing ML model architectures
- Proposed a generative machine learning project and received \$115K in funding

XONE TECHNOLOGY EMBEDDED SOFTWARE ENGINEER

May 2018 – August 2018 | Santa Clara, CA

- Worked on RF technology that uses Wi-Fi for remote sensing
- Created new system UI features for directional antenna readings and control

PROJECTS

COGNISENSE WITH PROF. JUSTIN ROMBERG

May 2023 - Present | Atlanta, GA

- Developing novel architectures and algorithms for state-of-the-art RF systems
- Combining high-fidelity models to simulate a full RF processing pipeline
- Model the effect of circuit nonlinearity, noise, and digitization/quantization
- Study closed-loop feedback for control and estimation in dynamic environments

DARPA TRIAD PRINCIPAL INVESTIGATOR

August 2021 - December 2022 | Atlanta, GA

- Tensors for Reconfigurable Intelligent Array Demonstrations (TRIAD)
- Managed several performers on a multi-million dollar budget
- Implemented a real-time demo of near-field microwave imaging using FPGA

PUBLICATIONS

- **A. Saad-Falcon**, C. Howard, J. Romberg, and K. Allen, "Level set methods for gradient-free optimization of metasurface arrays," *Scientific Reports*
- **A. Saad-Falcon**, B. Ancelin, and J. Romberg, "Subspace Tracking with Dynamical Models on the Grassmannian," *IEEE SAM 2024*
- **A. Saad-Falcon et al.**, "Applying an electrostatic cross-correlation to the CFTR-ATP interaction," *arXiv preprint*
- **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*
- **A. Saad-Falcon et al.**, "Abstraction and Acceleration of Tensor Processing for Element-Level Digital Arrays," *IEEE PAST 2022*

EDUCATION

GEORGIA INSTITUTE OF TECHNOLOGY

PHD IN MACHINE LEARNING

ADVISED BY JUSTIN ROMBERG

Graduating May 2026

GPA: 4.0/4.0

M.S. ELECTRICAL ENGINEERING
SPECIALIZATION IN DSP

Graduated Dec 2018 *with Honors*

GPA: 4.0/4.0

B.S. ELECTRICAL ENGINEERING
STAMPS PRESIDENT'S SCHOLAR

Graduated Dec 2017 *with Honors*

GPA: 4.0/4.0

COURSEWORK

MOST RECENT/RELEVANT

Machine Learning

Electromagnetics

RF Design/Simulation

High-Dimensional Prob/Stat

Compressed Sensing

DSP Algorithms/Hardware

Image Processing/Computer Vision

Data Structures and Algorithms

Computer Architecture

Data Analysis

SKILLS

COMPUTER LANGUAGES:

C/C++ • Python • Java

MATLAB • VHDL • Assembly

Rust • JavaScript • HTML • CSS

TOOLS & SKILLS:

Machine Learning:

PyTorch • TensorFlow • Scikit

Virtual Machines:

VMware • VirtualBox • Docker

Instrumentation and Testing:

Soldering • Oscilloscope • DMM

Function Generator • EAGLE

Data Acquisition • LTSpice • Excel

Utilities:

Git • Makefile • RPM • Gradle