

Muhammad Osama Sakhi

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Education

Georgia Institute of Technology

Atlanta, Georgia

MASTER OF SCIENCE IN COMPUTATIONAL SCIENCE & ENGINEERING

Aug 2017 - Dec 2019

- **GPA:** 3.85
- **Coursework:** Computer Vision, Deep Learning, Computational Data Analysis, Numerical Linear Algebra, Machine Learning for Trading, Computational Chemistry, Quantum Mechanics, Modeling & Simulation, Algorithms

Georgia Institute of Technology

Atlanta, Georgia

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

Aug 2013 - May 2017

- **GPA:** 3.86
- **Concentrations:** Devices & Intelligence
- **Coursework:** Machine Learning, Natural Language Processing, Artificial Intelligence, Design and Analysis of Algorithms, Robotics & Perception, Systems & Networks, Digital Design Lab, Prototyping Intelligent Appliances

Skills

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|--------------------------------|---|
| Artificial Intelligence | Graph Search Algorithms, Probabilistic Inference, Particle Filtering, Markov Decision Processes |
| Machine Learning | Deep Learning, Q-Learning, Object Detection, Image Classification, Clustering |
| Programming | Python, C, C++, SQL, Java, Golang, JavaScript, HTML, MATLAB |
| Frameworks | PyTorch, Scikit-Learn, Pandas, OpenCV, SimPy, Spark |
| Other | AWS, GCP, Docker, Kubernetes, REST APIs, LaTeX |

Research

The REDUCE Project

Dr. Munmun De Choudhury

GT SOCIAL DYNAMICS & WELLBEING LAB

Jul 2019 - Present

- Created language model embeddings for social media data to feed into time-series model to forecast weekly suicide attempts
- Collaborating with teammates to determine additional time-series streams that may aid the forecasting problem
- Training regression model using language features from millions of Tweets to serve as one learner in final ensemble approach

Facebook SUMO Challenge

Dr. Frank Dellaert & Dr. Ren

RESEARCH ASSISTANT

Sep 2018 - Mar 2019

- Trained a Faster-R-CNN network on 360 Degree RGB-D images to localize bounding boxes in 2D
- Recovered 3D bounding box predictions from 2D object detections for 100+ categories to place 2nd in SUMO Challenge
- Contributed to baseline methods for SUMO dataset paper with collaborators from Stanford and Princeton
- Started implementation of deformable convolutions for 3D voxel inputs

Computing Betweenness Centrality

Dr. Oded Green

HIGH PERFORMANCE COMPUTING LAB

Aug 2016 - May 2017

- Ported algorithm for computation of betweenness centrality on dynamic graphs onto NVIDIA GPUs using cuStinger framework

Experience

Georgia Institute of Technology

Atlanta, Georgia

HEAD TEACHING ASSISTANT FOR INTRO. TO ARTIFICIAL INTELLIGENCE

Aug 2019 - Present

- Managing a team of 17 Teaching Assistants in grading coursework and proctoring exams for 450 undergraduate students
- Developed entirely new mass autograder system with built-in plagiarism detector to reduce the time each TA must spend grading from 2 hours to 15 minutes.
- Served as guest lecturer on Particle Filtering for a class section with 300 students
- Creating new material with detailed explanations of concepts such as Admissible & Consistent Heuristics and Mutual Information and with additional examples to ensure students have a firm grasp of course material
- Leading review sessions to help students better understand course concepts in preparation for projects and exams

The Home Depot

Smyrna, Georgia

COMPUTER VISION INTERN

May 2019 - Aug 2019

- Fine-tuned 20+ models to extract fine-grained features from furniture images to enable training of a generative model that could produce aesthetically compatible furniture collections
- Developed a reusable framework for quickly aggregating images from the various data sources, performing data cleanup and augmentations, fine-tuning ResNet/VGG models, and finally evaluating using F1 scores and confusion matrices

DukeTIP

Houston & Atlanta

INSTRUCTOR

Jun 2018 - Jul 2018

- Taught a total of 40 students for four weeks across two courses: Modern Programming and Artificial Intelligence
- Designed syllabi, conducted parent-teacher conferences and crafted assignments spanning five core topics: Fundamentals of Python Programming, Web Development, Pathfinding, Machine Learning, Natural Language Processing

Pindrop

Atlanta, Georgia

SOFTWARE ENGINEER

Jun 2017 - Jun 2018

- Automated a data collection task that consumes 90 days' worth of data for researchers to create adaptive fraud detection models
- Optimized memory consumption for a new service to use 75% less memory than previous implementations
- Created new framework for continuous deployment of fraud detection models to production systems
- Migrated database records from Postgres to Redis and used custom key-value encoding to optimize lookup time

Georgia Institute of Technology

Atlanta, Georgia

TEACHING ASSISTANT FOR INTRO. TO ARTIFICIAL INTELLIGENCE

Fall 2016 & Spring 2019

- Lead review sessions to help students better understand course concepts in preparation for projects and exams
- Graded coursework, proctored exams, held weekly office hours to ensure students understood the course material and projects

Pindrop

Atlanta, Georgia

SOFTWARE ENGINEERING INTERN

May 2016 - Aug 2016

- Designed database performance experiment to help determine which relational database scaled appropriately for the expected load of 1 million requests/day
- Helped re-architect existing monolithic backend API server with smaller, independent microservices

The Home Depot

Atlanta, Georgia

RESEARCH & DEVELOPMENT INTERN

Mar 2015 - Aug 2015

- Designed path planning algorithm for semi-autonomous floor cleaning bot to traverse store aisles
- Utilized Computer Vision and Optical Character Recognition libraries to scrape Driver's License information from images
- Created handwriting recognition Android app to allow for quicker product searches and checkout
- Developed a walkie-talkie Android application that communicates using WebSockets to relay audio messages in real time

BitPay

Atlanta, Georgia

SOFTWARE ENGINEERING INTERN

May 2014 - Aug 2014

- Integrated analytics system throughout BitPay application to monitor site responsiveness and activity for 35,000 merchants
- Implemented analytics capabilities for internal teams to measure merchant volume and sales information across countries, currencies, and industries using Node.js and MongoDB
- Designed database schemas and executable utilities to enable automated daily financial settlements of \$1M to merchants

Standard Code

Atlanta, Georgia

WEB DEVELOPER INTERN

Oct 2013 - May 2014

- Developed internal project milestone management platform using MySQL and Ruby on Rails

Presentations

Generative Adversarial Network Paper Discussion

Atlanta, Georgia

DISCUSSION LEAD

Sep 2019

- Reflected on the strengths of the GAN paper by Ian Goodfellow to contrast a colleague who presented on the weaknesses of the paper
- Presented the concept of GANs and the intuitions that went into its development to an audience of 50 graduate students

TEDxGeorgiaTech Spring Conference

Atlanta, Georgia

FINALIST STUDENT SPEAKER

Apr 2019

- Chosen as the sole GT student to return as a speaker for April 2019 Conference in front of an audience of 400

TEDxGeorgiaTech Fall Conference

Atlanta, Georgia

STUDENT SPEAKER

Nov 2019

- Selected among 70 applicants to deliver a TED talk in front of a crowd of 200 students
- Presented on the importance of mentorship and on inspiring students to find their passions

Extracurriculars

Georgia Tech IEEE

WEBMASTER

- Developed completely new public site that allows all officers to post updates using just Markdown

Atlanta, Georgia
Aug 2014 - Apr 2015

Georgia Tech RoboJackets

SOFTWARE TEAM

- Utilized Arduino with Lego Bricktronics components to build simple robots that navigate without colliding into obstructions
- Developed firmware to interact with updated hardware for autonomous soccer-playing robots for International RoboCup competition

Atlanta, Georgia
Sep 2015 - Feb 2016

Startup Exchange

MEMBER

- Attended weekly meetings and learned about the challenges of running a startup, from ideation to funding to intellectual property to maintaining a userbase

Atlanta, Georgia
Sep 2013 - May 2014

Georgia Tech Student Government Association

SUSTAINABILITY COMMITTEE MEMBER

- Established sustainability reward system for club events across campus to promote green habits

Atlanta, Georgia
Sep 2013 - May 2014

Honors & Awards

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|------|---|
| 2019 | 2nd Place , Facebook SUMO Challenge 3D Object Detection Track |
| 2017 | Highest Honors , Georgia Institute of Technology Spring 2017 Graduation |
| 2016 | Recipient , Faculty Honors |
| 2015 | Recipient , Faculty Honors |
| 2014 | Scholarship Recipient , Asian & Pacific Islander American Scholarship Fund & Wells Fargo Scholarship |