

# Zack Nawrocki

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## Experience

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**Context Labs, Software Engineer III (August 2022-Current), Software Engineer I** May 2020 - Current

- Played a critical role in securing our series B funding, through leading components of our project deliverables for stakeholders.
- One of the first 15 engineers at Spherical Analytics, which is now Context Labs.
- Founded at MIT, Context Labs integrates blockchain technology with big data ingestion and machine learning, to put trust into data for advanced analytics, investment purposes, and to provide a strategic tool for environmental impact.
- My work includes data ingestion, software development, machine learning for the purpose of analytics and processing big data, projects tailored towards stakeholders, and data pipeline architecture management.
- Developed, maintained, and had project ownership over Spherical Analytics' ingestion engine, a system that collects data from specified sources, processes and cleans this data, and then outputs it into the blockchain, data storage locations, and our analytics platform. The ingestion engine stack consists of Python, Airflow, SQL, RabbitMQ, Docker, Kubernetes, Flask, and AWS S3.
- Used XGBoost models to predict free cash flow to the firm for Oil and Gas companies on a quarterly basis.
- Developed algorithms to detect differences in data, at multiple states in the blockchain.
- Developed company and client Python libraries that utilize machine learning to process image data, video data, objects within satellite data, big data, and online data, and then convert into tabular information for ingestion.

**National Science Foundation - Lighting Enabled Systems & Applications, Software Development Research Intern** Jan. 2019 - May 2020

- Awarded a grant from the National Science Foundation to work on a project for the Lighting Enabled Systems & Applications Engineering Research Center, which is dedicated to developing autonomous intelligent systems, to address modern challenges in the connected environment.
- My project involved the area of autonomous HVAC control for smart buildings, in which I integrated occupant localization, optimized system controls, implemented and evaluated an integrated system for collecting user preferences, and worked on an efficient data-driven learning and MPC smart HVAC personalization algorithm, for cohabited work spaces.

**Lockheed Martin - Leidos Cyber, Software Engineer Intern** May 2018 - Aug. 2018

- Originally the commercial cyber security division of Lockheed Martin, Leidos Cyber was acquired by Capgemini while working here in 2018
- Developed and tested for the Industrial Defender Automation System Manager (ASM) platform, a management platform that aggregates event and state data from industrial endpoints across all vendor systems in one location for a single, unified view of operations.
- Responsible for the development and implementation of a new feature in ASM 7.1, where asset licenses are automatically classified before being configured on the ASM, as well as QA testing of ASM, ASA, agents, network-based intrusion detection systems, and other components of the Industrial Defender ASM Solution.

## Skills

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**Languages:** C++, Python, C, Java, Processing, JavaScript, PHP

**Fields of Experience:** Software Engineering, Data Engineering, Machine Learning, Artificial Intelligence, Data Science, Cybersecurity, Smart Efficient Buildings, Blockchain Technologies, Privacy, IoT, Smart Indoor Thermal Management HVAC Algorithms, Academia and Industry Research, Smart Lighting Systems

**Other Skills:** AWS, Azure, Project Management, Web Development, Vue.js, MEVN Stack, ROS, MQTT

## Selected Projects/Publications

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### Co-authored Smart HVAC Publication

Achieving Improved Personalization and Energy Efficiency in Cohabited Work-spaces through Data-driven Predictive Control (<https://par.nsf.gov/biblio/10186224>), published and presented at the American Society of Engineer's Dynamic Systems & Control Conference 2020, studies the problem of indoor zone temperature control in shared work-spaces, equipped with heterogeneous heating and cooling sources, with the goal of increased energy savings and environment personalization.

### TroyTutors.com

Founder of Troy Tutors, which is the only online educational platform that offers one-on-one tutoring for university students, in which tutoring is booked by the university and the relevant course at that university. All tutors are former students in the courses they tutor and attended the same university that the student attends. Sessions are held through state-of-the-art collaboration and communication software, which not only mitigates the challenges of online learning, but improves on the in-person learning experience. In addition to one-on-one tutoring, Troy Tutors offers live university lectures and recitations, drop-in office hours, discussion forums, job postings for internships and new-grad positions, summer tech talks, and Troy Tutors Tube, an online educational streaming service. I have grown the Troy Tutors platform, from just me, to a team of over 30 engineers, consisting of tutors, software engineers, interns, and operation managers. While I am less involved today in tutoring on Troy Tutors, I still host free office hours once a week, for students who cannot afford paid on-on-one tutoring, and a weekly recitation lecture. I have helped students, who were on the verge of failing out of their university, who are now interning and working at amazing companies, making breakthrough research contributions in their respective fields, and moving on to excellent graduate school programs.

## Agoro

Agoro is an automated educational ecosystem, which carries out the workflow of university departments, using artificial intelligence to enable university operations to be more affordable and efficient, including both accredited universities, as well as our personal online university learning platform. We are currently developing the Agoro autograder, which can automatically grade coding assignments, academic papers, and mathematics assignments. We will also be developing an AI teaching assistant and software to automate the operations of university departments. I started this project back in September 2022 and have brought on 13 engineers to develop this with me. I also hold lectures and provide one-on-one university lessons for students through our university program. I am very passionate about making education more affordable and accessible, and how artificial intelligence and our automated educational pipeline can be used to help with this.

## CollabLab

CollabLab is an all-in-one collaboration and communication solution. It allows engineers to write code together in real-time, run it, draw on virtual whiteboards, hold one-on-one and group video calls, host live webinars, chat, and screen share. An all-in-one solution for all of these tasks does not exist anywhere else. It offers laptop and tablet support and is compatible with the Apple Pencil and other common styluses. You can transmit drawings directly from your smartphone, if you do not have a tablet. You can try it out at <https://collablab.dev/demo>.

## The Smart Conference Room Project

This collection of projects advances many research areas related to smart, efficient buildings, HVAC, IoT, and lighting, as well as breakthroughs related to ToF location-based temperature and lighting occupant satisfaction, pre-heating/pre-cooling energy-saving algorithms, autonomous meeting management, and lowering energy consumption in buildings.

# Education

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## Rensselaer Polytechnic Institute (RPI)

2016 - 2020

Bachelor of Science in Computer Science, Concentrations: AI and Data, Systems and Software

Rensselaer Medal Award: the Medal, since 1916, recognizes superlative academic achievements and motivates students toward careers in science, engineering, and technology, guaranteeing \$30,000 per year in scholarships.

Other Awards: RPI Class of 2020 Honors Convocation Recipient, RPI Dean's Honor List

Clubs: RPI Computer Science Club, Alpha Sigma Phi (Head of Philanthropy/Webmaster/Academic Advisor/Alumni Relations)

# Conferences

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## Presenter at Dynamic Systems and Control Conference 2020, American Society of Mechanical Engineers

Oct. 2020

Selected by the American Society of Mechanical Engineers to present a co-authored publication at DSCC 2020.

## Speaker at "How do we get to SMART Cities?" Conference, Rensselaer Polytechnic Institute

Apr. 2020

Conference speaker, participated in presentations, poster sessions, and demos related to HVAC and IoT discoveries (the event was initially postponed due to COVID-19)

## Presenter at Beyond Illumination: IoT, AI, Machine Learning, and Autonomous Systems that Think Conference, The LESA Center

Apr. 2019

Presented and ran a demo of research breakthroughs, for members and attendees at LESA's 2019 Industry-Academia Days Conference.

# Other Links

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## Tutoring Reviews, <https://www.wyzant.com/Tutors/zachary>

I firmly believe great tutoring skills are very valuable as a software engineer, as it allows you to explain very complicated and technical situations in simple ways that anyone can understand. This is valuable when working with clients, assisting with onboarding engineers, or advocating for the best solution on a software engineering team. At the time of updating this resume, I have received 140 reviews on Wyzant.com. Every single review has been 5/5 stars. In my free time, in addition to tutoring on my own tutoring platform and in person, as a volunteer in my local community, I sometimes tutor people, of all ages and education levels, in computer science and mathematics on Wyzant.com.

## Live Availability, <https://doodle.com/mm/zacharynawrocki/availability>

This calendar shows in real time my current availability to talk over the phone, meet, and/or schedule an interview. It syncs with a calendar, which aggregates my work schedule, personal commitments, and project commitments, to list when I am free.

## Additional Places to Contact Me, <https://zacknawrocki.github.io/blog/Contact/>

In addition to my personal email and LinkedIn above, this webpage lists my personal, professional, and project contact info, including email addresses and links to directly message me.

## Google Scholar, <https://scholar.google.com/citations?hl=en&user=QrTLJJ8AAAAJ>

I greatly enjoy reading the latest computer science and mathematics papers on Google Scholar every morning. This is my Google Scholar profile, which lists my research interests, my academic contributions, and the brilliant research colleagues (as well as great friends) I have had the privilege of working with during my undergraduate studies at Rensselaer.

# Relevant Coursework

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Randomized Algorithms for Machine Learning and Optimization, Machine Learning from Data, Programming Languages, Operating Systems, Introduction to Artificial Intelligence, Open Source Software, Software Design and Documentation, Network Programming, Principles of Software, Introduction to Algorithms, Computer Organization, Foundations of Computer Science, Data Structures, Computer Science I, Differential Equations, Multivariable Calculus and Matrix Algebra, Calculus II, and Calculus I