Alexander Fache

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OBJECTIVE

Master's electrical engineering student seeking full-time employment starting spring 2022. Prior experiences with control theory, advanced programming, computer vision, and quadcopters interested in developing autonomous systems.

EDUCATION

Georgia Institute of Technology (Georgia Tech) | Atlanta, GA

   M.S. Electrical Engineering (GPA: 3.80 / 4.00)   **01/2021 - 12/2021**
- Systems and Controls

   B.S. Electrical Engineering (GPA: 3.83 / 4.00) Highest Honors   **08/2016 - 12/2020**
- Minor: Computer Science Intelligence, Robotics

SKILLS

YouTube Channel: Drone tutorials, builds, flights. 700+ subscribers, 70,000+ views

Programming: [advanced] Python, [intermediate] Matlab, JavaScript, C, C++, Java

Software: [advanced] Jupyter Notebook, Numpy, [intermediate] Git, React.JS, MongoDB, Heroku, Postman, MERN, Sklearn, OpenCV, PyTorch, iMovie, Inventor, [beginner] ROS 2

Hardware: [intermediate] Arduino, Raspberry Pi, Pixhawk 4, soldering, benchtop electronics equipment

Fabrication and Machining: [intermediate] 3D printing, laser cutting, woodshop

Coursework: linear/non-linear/network controls, image processing, computer vision, machine learning, game AI, convex optimization, data structures and algorithms

Communication: public speaking, technical presentations, technical writing, lead group discussions

Interests: ultimate frisbee (Division I), quadcopter FPV flying, investing, scuba diving (PADI open water certified)

Spoken Languages: English (native), Flemish (native)

INTERNSHIP EXPERIENCE

Software Engineering Intern - Avionics Integration | Bell Textron Inc | Fort Worth, TX   **07 – 08/2020**
- Researched air-launched effects integration requirements for FARA mission via technical data sheets and development meetings.
- Implemented and validated fuzz burn chip detect module through loopback testing for early engine failure warning for DCU.

R&D Intern - Center for Cyber Defenders | Sandia National Laboratories | Albuquerque, NM   **05 - 07/2019**
- Engineered functionality of an automated hardware tester to increase efficiency of chip testing and analysis for an internal lab.
- Constructed ontologies and developed natural language processing techniques to categorize and structure PDF data.

RESEARCH EXPERIENCE

Undergraduate Research Assistant | Intelligent Vision and Automation Laboratory (IVALab) | Georgia Tech   **08/2018 – 04/2020**
- *PI: Dr. Patricio Vela, ivalab.gatech.edu*
- Prototyped rectilinear motion primitive commands in Matlab for a robotic snake then transcribed to ROS-Python.
- Developed a head scan motion primitive to increase the field of view for increased SLAM keypoint detection.
- Tracked robotic snake with a Turtlebot Kobuki using web camera, magenta markers, linear and angular PID control.

PUBLICATIONS

A. Faché, et al., "Marsupially-Aided Robotic Snake Exploration and Navigation of Cluttered Environments," in *Proc. Nat. Conf. Undergraduate Res.*, Kennesaw, GA, USA, Oct. 2019, pp. 526-536.

PROJECTS

Autonomous Boat Perception and Navigation | Marine Robotics Group | Georgia Tech   **08/2021 – Present**
- Implementing navigation and perception algorithms for autonomous boat. Python, ROS 2.

Fantasy Football Matchup Visualization Tool + MERN Web Framework | Personal Project   **07/2021 – Present**
- Detailed visualizations for historical fantasy matchups. Developed using web scraping, React.JS, JavaScript, MongoDB, Heroku.

Pixhawk 4 Autonomous Quadcopter | Personal Project   **05/2020 – Present**
- Built autonomous drone using Pixhawk 4 flight controller. Created complementary step-by-step YouTube tutorials.

Kidney Cancer Clinical Decision Support | Introduction to Medical Image Processing | Georgia Tech   **02 – 04/2020**
- Used patient tissue samples to perform preprocessing, feature extraction, and supervised learning to develop predictive models.

Property Management via Aerial Drone Imaging, Processing, Change Detection | ECE Capstone | Georgia Tech   **01 – 12/2020**
- Data capture via Parrot Anafi drone. Anomaly detection through preprocessing, image differencing, grass health score analysis.

PID Ball Balancer | Introduction to Automation and Robotics | Georgia Tech   **10 – 12/2019**
- Assembled and programmed 3-legged platform capable of stabilizing ping pong ball using camera feed input and PID control laws.

LEADERSHIP

Peer Instructor | The Hive (Electrical and Computer Engineering Makerspace) | Georgia Tech   **09/2018 - Present**
- Teach and assist students to use prototyping equipment and tools for hands-on projects and engineering development.