Alexander Fache

afache3@gatech.edu | 650-933-0061 | Citizenship: USA, Belgium
youtube.com/c/AlexFache | *alexanderfache6.github.io* | *linkedin.com/in/alexanderfache*

OBJECTIVE

Master's electrical engineering student seeking engaging full-time summer 2021 internship position utilizing drones, autonomy, and vision. Past coursework in non-linear systems & controls theory, computer vision, and image processing.

EDUCATION

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

M.S., Electrical Engineering **01/2021 - 12/2021**

B.S., Electrical Engineering - Highest Honors **08/2016 - 12/2020**

- Minor: Computer Science - Intelligence, Robotics

SKILLS

YouTube Channel: Drone tutorials, builds, flights. 500+ subscribers, 50,000+ views
Programming: Python, Matlab, JavaScript, C, C++, Java, HTML/CSS
Software: Git, Jupyter, MongoDB, React.JS, MERN web stack, Heroku, Postman, PyTorch, Numpy, Sklearn, OpenCV, Android Studio
Hardware: Arduino, Raspberry Pi, Pixhawk 4, soldering, benchtop electronics equipment, Taranis transmitter
Fabrication and Machining: 3D printing, laser cutting, woodshop
Coursework: linear/non-linear systems & controls theory, 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: quadcopter FPV flying, ultimate frisbee (Division I), investing, scuba diving (PADI open water certified)
Spoken Languages: English (native), Flemish (native)

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.

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.

PROJECTS

Foam RC Plane | Personal Project **05/2021 – Present**

- Built RC plane using off the shelf electronics and foam board. Plans to add GPS and telemetry capabilities.

Workout planner using MERN full-stack web application framework | Personal Project **01/2021 – 03/2021**

- Learned, developed, and deployed a MERN web application on Heroku allowing logged in users to create and track workouts.

Pixhawk 4 Autonomous Quadcopter | Personal Project **05/2020 – Present**

- Built autonomous drone using Pixhawk 4 flight controller. Created complementary step-by-step YouTube tutorials.

US Traffic Accidents and Weather Events Analysis | Machine Learning | Georgia Tech **02 – 04/2020**

- Analyzed weather conditions and road factors to predict traffic accident crash severity using several supervised learning models.

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.