Alexander Faché

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OBJECTIVE

Robotics research assistant and drone enthusiast seeking engaging full-time summer 2021 internship positions within the field of robotics and autonomy. Self-starter making a profound impact on every team.

EDUCATION

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

M.S., Electrical Engineering **starting 01/2021**

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

- GPA: 3.87 / 4.00
- Minor: Computer Science - Intelligence, Robotics

SKILLS

Programming: Python, Matlab, C, C++, Java, HTML/CSS
Software: Git, Jupyter, Android Studio, OpenCV, ROS, Firebase, Autodesk Inventor, Adobe Illustrator, Blender
Hardware: Arduino, Raspberry Pi, Pixhawk 4, soldering, benchtop electronics
Fabrication and Machining: 3D printing, laser cutting, woodshop
Robotics: linear systems and controls, image processing
Computer Science: data structures and algorithms, mobile applications and services, machine learning, game AI
Communication: public speaking, technical presentations, technical writing, lead group discussions
Interests: quadcopter FPV flying, investing, ultimate frisbee (Division I), scuba diving (PADI open water certified)
Spoken Languages: English (native), Flemish (native)
YouTube: Drone tutorials, builds, flights. 250+ subscribers, 20,000+ views

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 and AWARDS

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.

A. Faché, S. James, K. Lie, A. Chang, and P. Vela, "Cooperative Exploration of Unknown Environments Using a Robotic Snake-Turtlebot Leader-Follower Pair," presented at Georgia Tech, Atlanta, GA, USA, Apr. 2020. (receiver of Peer Review Award for best visual poster)

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

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 PID control laws and camera feed input.

Freestyle FPV Quadcopter and Pixhawk 4 Autonomous Quadcopter | Personal Project **01/2019 – Present**

- Built freestyle quadcopter. Built autonomous drone using Pixhawk 4 flight controller. Created complementary YouTube tutorials.

LEADERSHIP

Peer Instructor | The Hive - Electrical and Computer Engineering Makerspace | Georgia Tech | Atlanta, GA **09/2018 - Present**

- Teach and assist students to use prototyping equipment and tools for hands-on projects and engineering development.