

Karim Samaha

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OBJECTIVE	A self-motivated electronics hobbyist, looking to leverage extensive fast-prototyping skills, both in hardware and software, in the development of innovative robotics and automation solutions.	
EDUCATION	Swiss Federal Institute of Technology(EPFL), Switzerland <i>Master's in Robotics, Microengineering</i> GPA 5.5/6	September 2020-Present
	American University of Beirut Lebanon <i>Bachelor of Engineering, Mechanical Engineering</i> GPA 4/4	
	Collège Notre Dame de Nazareth Lebanon <i>French Baccalauréat TS</i> 17.47/20	
PROFESSIONAL EXPERIENCE	Synkers, Local Tutoring Company, Lebanon <i>Certified Tutor</i> <ul style="list-style-type: none">• Tutoring university courses related to engineering and sciences both in groups and in private.	June 2018-Present
	American University of Beirut, Lebanon <i>Undergraduate Research Assistant with Prof. Daniel Asmar at the Mechanical Engineering Department</i> <ul style="list-style-type: none">• Worked closely with different mobile robots such as the Pioneer 3AT and the KUKA Youbot.• Participated in a research project related to computer vision and machine learning.	September 2018-June 2020
	University of Waterloo, Canada <i>Research Intern with Prof. John Zelek at the Systems Design Department</i> <ul style="list-style-type: none">• Implemented a deep neural network for camera calibration from video sequences.• Developed a new image generation algorithm using Unity as a game engine.	May-August 2019
ACADEMIC PROJECTS	Tensegrity-Based Morphing Wing <i>Semester Project</i> <ul style="list-style-type: none">• Explored the feasibility of morphing tensegrity structures in an aerodynamic setting• Designed, modelled and manufactured a tensegrity-based wing that can achieve roll and pitch control through morphing	February 2021-June 2021

	Autonomous Navigation System for a Drone February 2021-June 2021 <i>Aerial Robots</i> <ul style="list-style-type: none"> • Implemented an autonomous navigation algorithm on the Crazyflie drone using Python • The navigation system relies on a velocity controller which uses optical flow for stability and range sensors in a potential field framework for obstacle avoidance 	
	Camera Controller Design using an FPGA September 2020-January 2021 <i>Embedded Systems</i> <ul style="list-style-type: none"> • Designed a camera controller for the TRDB-D5M CMOS camera using Intel Quartus and NIOS • The controller reads pixel values in real-time from the CMOS sensor, processes them, and stores them in memory. 	
TECHNICAL SKILLS	Modeling and Manufacturing <ul style="list-style-type: none"> • Modeling mechanical components using AutoCAD, Creo or Solidworks. • Performing stress and motion analysis on Solidworks. • Building mechanical components using different manufacturing processes (3D printing, CNC, Drilling, Lathing, Milling). Electronics <ul style="list-style-type: none"> • Programming microprocessors or microcontrollers (Raspberry Pi, Arduino, PIC, MSP432). • Designing and testing embedded systems on FPGA using Nios and Intel Quartus. • Building complex electronics systems using multiple sensors, actuators and communication interfaces. Programming Skills Python, OpenCV, Tensorflow, Keras, Numpy, C++, MATLAB, C#, LabVIEW IT Microsoft Office, Adobe Photoshop, Adobe Illustrator Soft Skills Organized, Creative, Hardworking, Ambitious, Maker	
LANGUAGES	CEFR C2 in English, French and Arabic CEFR A2 in German	
HONORS AND AWARDS	First Place in FYP Accelerator Program 2020 Dean's Honor List First Place in FEA Robotics Competition	Spring 2020 Spring 2016-Fall 2019 Fall 2016-2017
EXTRACURRICULARS	01Tutor, Interactive Learning Platform July 2020-Present Developing an online interactive learning platform. The platform offers university students an accessible and innovative means to consolidate their knowledge in engineering and sciences	
	HiveMate, Vision System for Bee Swarm Prevention September 2019-Present Developing a vision system capable of identifying swarm cells withing a hive. The intricate design consisting of a rotating fish-eye camera coupled to a convolutional network estimates the presence of swarm cells attached at the bottom of the frames.	
	IEEE Robotics Hackaton February 2019 Designed a quadruped robot capable of replicating the creep gait using Solidworks as a modelling tool and an Arduino as a microcontroller. The robot can be used for the inspection of tight spaces such as ventilations and electrical systems.	
PERSONAL DETAILS	Age 23, Single Type B Permit , No Military Obligation	