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Nantes, FRANCE
Canadian (with French work visa)

JULIAN ERSKINE

I am a PhD student working on multi-agent UAV systems, with practical experience in aerial robotics, formation control, and prototype design and testing



WORK EXPERIENCE & PROJECTS

PhD Student/Researcher

Laboratoire des Sciences du Numérique de Nantes

September 2018 - Present Nantes, France

Research and Engineering (See pg. 2 for published work):

- Developed decentralized control algorithms for fast quadrotor formations using onboard vision to maintain formation shape.
- Performed a comprehensive analysis of formation controller singularities
- Wrote software for validating scientific work on real UAV systems
- Standardized the use of common software and hardware across the many UAV projects in the lab, decreasing the time required for experiments.
- Reviewed papers for IEEE and ASME journals and conferences

Other Works:

- Instructed labs (in English and French) on the modelling and control of serial robots and non-linear systems using C++, Matlab and Simulink
- Coordinated the expansion of the drone fleet and testing arena
- Ran UAV demos for audiences ranging from the public to UAV experts

Research Assistant

Laboratoire des Sciences du Numérique de Nantes

February 2018 - August 2018 Nantes, France

- Developed a general methodology for modelling the wrench capabilities of reconfigurable quadrotor-based aerial cable-towed systems
- Designed and simulated a non-linear controller for a payload suspended from multiple quadrotors for accurate dynamic trajectory tracking
- Built, programmed, and tested a prototype with three Pixhawk-based drones for experimental validation of controller and wrench analysis
- Published results in international conferences and journals

Miscellaneous Smaller Projects

École Centrale de Nantes

September 2016 - December 2017 Nantes, France

- Workspace mapping, design optimization, and reconfiguration planning for discretely reconfigurable cable-driven parallel robots
- Optimal kinematic design and placement of serial and parallel robots
- Computer vision, visual odometry, and visual servoing using OpenCV

Engineering Internships and Summer Jobs

ATCO Gas

May - Dec, 2014 Edmonton, AB

Designed and managed natural gas distribution pipeline projects

Surette Battery Company

Jan - Apr, 2014 Springhill, NS

Assisted in H&S, product quality, and production improvements

Seven Lakes Development

May - Aug, 2016 Porters Lake, NS

Worked as a chainsaw operator to clear lots in a newly created subdivision

Big Cove YMCA Camp

Jun - Aug, '11-13,15 Thorburn, NS

Management, lifeguarding, and counselor roles at a youth summer camp

EDUCATION

PhD in Robotics (in progress)

École Centrale de Nantes

2018 - 2021 Nantes, France

Thesis title: Robust Control of Heterogenous Dynamic Drone Swarms

NSERC PGS-D Research Scholarship

M.Sc. in Advanced Robotics

École Centrale de Nantes

2016 - 2018 Nantes, France

Thesis title: Design and Control of Aerial Cable-Towed Systems

GPA - 17.9/20 Class Ranking - 1st

ECN Masters Thesis Research Scholarship

B.Eng. in Mechanical Engineering

Dalhousie University

2011 - 2016 Halifax, Canada

GPA - 3.65/4.3

3x Sexton Scholar Award

Int. Baccalaureate Entrance Scholarship

LANGUAGES

English ★★★★★
French ★★★★★

SKILLS

Programming

My areas of proficiency are:

C++ Python Matlab/Simulink ROS
PX4 Linux

Design

I have used the following design tools:

SolidWorks MSC Adams 3D Printing

Robotics

My direct experience includes:

Quadrotors Parallel Robots Swarms
Non-Linear Control Optimal Control
Visual Servoing Serial Robots
Kinematic & Dynamic Modelling