George Sideris

linkedin.com/in/sideris-george george.sideris@mail.mcgill.ca

Education

McGill University | Montreal, QC, Canada Aug. 2019 – May 2024

Bachelor of Engineering, Mechanical Engineering (Internship Program)

Distinctions: Engine Design Prize - SURE Award - Science Prize - VFS Team Captain - MIAE VP External

Graduate Coursework: Applied Machine Learning - Probability, Statistics and ML for Mechanical Engineering - Control Systems

Marianopolis College | Montreal, QC, Canada Aug. 2017 – May 2019

Diploma of College Studies, Honours Health Science

Distinctions: Dean's List Fall 2017/18 - Silver Key Scholarship - Recognition for Contribution to Student Life - Robotics Captain

Academic Research Experience

NeuroImaging and Surgical Technologies Lab | McGill University, Canada Aug. 2023 – Present

Team Lead, Capstone Research Project (Advisor: Dr. Louis Collins)

- Led a team of 4 to create a multi-camera tool localization setup for occlusion-robust pose estimation of surgical tool tip with sub-centimeter accuracy. Designed and fabricated fixture for attaching cameras to operating room light. Implemented algorithms for multi-camera calibration and monocular object tracking using ArUco fiducial markers. Implemented data fusion strategy based on tracking a shape-biased group of markers attached to the surgical tool. Designed and implemented a Kalman filter to perform uncertainty-robust pose estimation of the tool. Achieved 2nd place Engine Capstone Design Prize for Entrepreneurship.

Aerospace Mechatronics Lab | McGill University, Canada May 2023 – Aug. 2023

Undergraduate Research Assistant (Advisor: Prof. Inna Sharf)

- Assisted in research towards the autonomy of articulated machines for timber-harvesting, with focus on refining a real-time CNN approach to grasping. Created datasets to train a multi-stage CNN that performs grapple and log segmentation, grapple opening prediction, and log counting using sim-to-real methods. Two segmentation CNNs were trained, one for the testbed with 289 images and one for Isaac Sim simulation with 512 images, each augmented 11 times. The dataset for training opening prediction and counting was created from 7045 simulation images with grapple opening and log count labels.
- Integrated draw wire sensor on log loader grapple at FPInnovations (Pointe-Claire, QC) testbed to experimentally validate the CNN. Programmed headless ROS server on Jetson using Python to transform sensor readings to grapple opening. Programmed client to communicate with server wirelessly for data streaming, calibration, thread control and data recording.
- Designed and fabricated end-effector linkage for experimental validation of grapple anti-sway methodology. Fitted linkage with IMUs and integrated it to Jaco robotic arm to measure trajectory sway.

Industry Experience

Lockheed Martin CES | Montreal, QC, Canada Jan. 2022 – Aug. 2022

Repair and Tool Engineering Intern (Supervisor: Dr. Fethi Hamdani)

- Conducted literature review on ML methods for defect detection. Created dataset of 100+ labelled images from defective shop floor parts using stereo-microscope. Drafted AI integration sections for NGen proposal on automated visual inspection of HPT parts valued at $8M CAD.
- Designed custom tools for jet engine maintenance tasks using AutoCAD; produced technical drawings and procured materials for the in-house fabrication of 10+ tools. Created LMCES's first Parts Manufacturer Approval candidate part drawing for F108 fan duct aft seal retainer.
- Dispositioned 12 cases of defect findings on CFM, CF34, and CF6 engine components to restore them to serviceable condition, resulting in savings surpassing $150K CAD. Wrote technical instructions for new spot-weld repair on cooling air manifolds.

Bombardier Aerospace | Montreal, QC, Canada May 2021 – Dec. 2021

Project Engineering Intern (Supervisor: Ryan Jayatunge, Project Management Lead)

- Developed an Excel data tracking and visibility tool for managing of aircraft design modifications using VBA. The tool is used by the Project Engineering team on a weekly basis for planning purposes, reducing the previous weekly workload by 4 person-hours.
- Tracked stress and materials & processes items from inception to disposition using Excel, SharePoint and Power BI in-house tools; presented weekly status report to Senior Director. Created presentations for supplier meetings. Coordinated daily morning meetings.

Extracurricular Experience

McGill Vertical Flight Society Projects Team | McGill University, Canada Aug. 2022 – June 2023

Team Co-Captain

- Co-led a team of 20 undergraduate engineering and computer science students to design and build a 20 lb., 10 ft dia. blended-wing tail sitter that can perform hover to cruise transition. Gave presentations on unmanned aerial vehicle design and manufacturing and held workshops for technical skills (digital electronics, Arduino programming, composites manufacturing). Achieved 3rd place at the 2023 DBVF competition and received Perseverence award.
- Designed control surface geometries by iterating aerodynamic profiles of different configurations using FlightStream.

Team Captain *Aug. 2021 - July 2022*

- Led a team of 8 to design and build a 15 lb., 6.5 ft dia. quadrotor with airfoils that can perform hover to cruise transition. Received Best Drawing Package award.
- Designed custom frame parts, and performed FEA on them using Abaqus.
- Developed wing-tilt mechanism and programming controls for integrated stepper motor using Arduino Nano.

Structures Lead *Aug. 2020 - July 2021*

- Collaborated with 8 teammates to design and manufacture a 1-meter dia. hex-copter. Launched and coordinated a sub-team to create the team's first custom frame. Designed drone CAD model and drawings using SolidWorks.

McGill Institute for Aerospace Engineering | McGill University, Canada June 2021 – June 2022

VP External

- Organized the inaugural AeroFair, a job fair targeted to recruiters from the aerospace industry. Secured attendance of 12 professionals from 6 companies. Coordinated and presented at the event, attended by over 100 students.
- Organized two Python workshops presented by McGill alumni. WS1: Intro to Git and APIs. Built a Flight Tracker using Pandas. WS2: CNNs for Fault Classification. Built autoencoder to classify 4 types of 3D printing defects.

Presentations (Institutional)

Capstone Poster Presentation, presented on 2024/04/03 at McGill University. Poster Title: Multi-Camera Surgical Tool Localization Setup for Image-Guided Neurosurgery

Undergraduate Research Poster Presentation, presented on 2023/08/17 at McGill University. Poster Title: Dataset Creation and Experimental Validation of a Multi-Stage CNN for Log Loader Grapple Characterization

McGill Institute for Aerospace Engineering Internship Panel Presentation, presented on 2022/10/25 at McGill University. Presentation Title: My Internship Experiences in Montreal's Aerospace Sector

Awards

Engine Capstone Design Prize (2024/04): https://www.mcgill.ca/engine/funding-programs/students/engine-capstone-design-prize/2024
SURE Award (2023/05 – 2023/08): undergraduate research scholarship awarded on a competitive basis.
VFS DBVF Competition 3rd Place Team Award (2023/06): this is a team award (Role: Co-Captain).
VFS DBVF Competition Best Drawing Package Distinction (2021/06)
McGill Science Prize (2019/08): in recognition of student achievement and promise in science and mathematics.
Silver Key Scholarship (2018/10): in recognition of second-year students in good academic standing and whose involvement on campus and in the wider community exemplify the Marianopolis College's mission and vision.

Skills

Programming: Python, ROS, Linux (Unix Shell), Isaac Sim, Matlab, Simulink, C++ (Arduino), VBA, Excel, LaTeX
Design: SolidWorks, AutoCAD, Abaqus, Mastercam, Cura, FlightStream