

Juan-Diego Florez

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Education

Doctor of Philosophy in Robotics

Georgia Institute of Technology, Atlanta, GA
Advisor: Dr. Frank Dellaert

Aug. 2020 – May 2024

Master of Science in Robotics Engineering

Worcester Polytechnic Institute, Worcester, MA
Advisor: Dr. Marko Popovic
– Bruce Manooch Space Research Fellow

Aug. 2018 – May 2020

Bachelor of Science in Mechanical Engineering, *Magna Cum Laude*

Florida Institute of Technology, Melbourne, FL
– Tau Beta Pi Engineering Honor Society

Aug. 2014 – May 2018

Professional Experience

Georgia Institute of Technology, Borg Lab

Graduate Research Assistant – Robotics Estimation and Control

Atlanta, GA

Jan. 2021 – Present

- Programmed impedance controller (ROS, C++) for haptic teleoperation of the Franka Emika Panda manipulator
- Developed a low order representation of human trajectories using GTSAM factor graph estimation (Python, C++)
- Contributed to the mechanical design and evaluation of cable-driven parallel robot used to create graffiti art
- Developed design improvements for a cable-driven parallel robot used to create graffiti art (submitted to ICRA 2022)

Independent Research

Researcher – General Analytical Inverse Kinematics Solver

Atlanta, GA

Jan. 2019 – Present

- Developed an analytical inverse kinematic solver (MATLAB, C++) for robotic manipulators with joint offsets and redundant degrees of freedom in collaboration with another researcher
- Implemented solver on the Franka Emika Panda arm, generating up to 16 solution configurations

Georgia Institute of Technology, Space Systems Design Laboratory

Student Researcher – Vertical Entry Robot for Navigating Europa (VERNE)

Atlanta, GA

Aug. 2020 – Dec. 2020

- Worked in two teams to develop the mechanical design of both the anchoring system and the drill for the VERNE robot

Worcester Polytechnic Institute, Popovic Lab

Graduate Research Assistant – Compact Robotic Flow Control Valve

Worcester, MA

June. 2019 – Sept. 2019

- Designed and optimized a CAM-like valve (MATLAB, SolidWorks) for fluid-based actuation in robots
- Implemented the valve in a humanoid walking robot actuated by Hydro Muscle synthetic muscle actuators (accepted to BIODEVICES 2020 conference)

GT, WPI, FIT

Teaching Assistant

FL, MA, and GA

2017 – 2020

- Robot dynamics and kinematics, introduction to calculus, and introduction to physics

Academic Experience

Novel Bidirectional Elastic Nonlinear Element for Robotic Antagonistic Actuation

MS Thesis, Trans-Gravitational Robot, advised by Dr. Marko Popovic

Worcester, MA

Aug. 2019 – Sept. 2020

- Created a method for designing a novel, scalable, nonlinear elastic actuation element and implemented it in a joint actuated by an antagonistic, variable-stiffness actuator
- Worked in a team of two to design limbs capable of both locomotion and manipulation

Mars Multi-Rover System

BS Capstone Project, advised by Dr. Beshoy Morkos and sponsored by JPL

Melbourne, FL

Sept. 2017 – July 2018

- Led a multi-disciplinary team of 20+ and applied MBSE principles in development of two mini rovers (SolidWorks, ANSYS Workbench, C++), each with a 5 degree of freedom manipulator
- Implemented robot vision and pose control for manipulation and tool change tasks

Publications

- [1] Chen, Gerry & Baek, Sereym & **Florez-Castillo, Juan-Diego** & Qian, Wanli & Leigh, Sang-won & Hutchinson, Seth & Dellaert, Frank. (2021). Extended Version of GTGraffiti: Spray Painting Graffiti Art from Human Painting Motions with a Cable Driven Parallel Robot. (Preprint)
- [2] J. D'Agostino **et al.**, "Novel Compact Robotic Flow Control Valve for Bioinspired Exosuit and Other Applications," Biomedical Engineering Systems and Technologies. Springer International Publishing, pp. 17–38, 2021. doi: 10.1007/978-3-030-72379-8_2.
- [3] J. D'Agostino **et al.**, "Development of Bioinspired Exosuit Actuated with Hydro Muscles and Novel Compact Robotic Flow Control Valve," Proceedings of the 13th International Joint Conference on Biomedical Engineering Systems and Technologies. SCITEPRESS - Science and Technology Publications, 2020. doi: 10.5220/0008948600400049.