Juan-Diego Florez

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Education

Doctor of Philosophy in Robotics   Aug. 2020 – May 2024
Georgia Institute of Technology, Atlanta, GA
Advisor: Dr. Frank Dellaert

Master of Science in Robotics Engineering
Worcester Polytechnic Institute, Worcester, MA   Aug. 2018 – May 2020
Advisor: Dr. Marko Popovic
– Bruce Manooch Space Research Fellow

Bachelor of Science in Mechanical Engineering, *Magna Cum Laude*   Aug. 2014 – May 2018
Florida Institute of Technology, Melbourne, FL
– Tau Beta Pi Engineering Honor Society

Professional Experience

Georgia Institute of Technology, Borg Lab   Atlanta, GA
Graduate Research Assistant – Robotics Estimation and Control   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   Atlanta, GA
Researcher – General Analytical Inverse Kinematics Solver   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   Atlanta, GA
Student Researcher – Vertical Entry Robot for Navigating Europa (VERNE)   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   Worcester, MA
Graduate Research Assistant – Compact Robotic Flow Control Valve   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   FL, MA, and GA
Teaching Assistant   2017 – 2020
– *Robot dynamics and kinematics, introduction to calculus, and introduction to physics*

Academic Experience

Novel Bidirectional Elastic Nonlinear Element for Robotic Antagonistic Actuation   Worcester, MA
MS Thesis, Trans-Gravitational Robot, advised by Dr. Marko Popovic   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   Melbourne, FL
BS Capstone Project, advised by Dr. Beshoy Morkos and sponsored by JPL   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.