UNIVERSITY OF SOUTH FLORIDA

Defense of a Doctoral Dissertation

A Modular Framework for Multi-Rotor Unmanned Aerial Vehicles
for Military Operations

by

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For the Ph.D. degree in Computer Science and Engineering

Multi-Rotor Unmanned Aerial Vehicles (MR-UAV) are commonly used in a variety of military operations. However, having multiple models leads to complex logistics, training, and overall increased costs. In this work, we present a modular MR-UAV framework that allows a user to quickly tailor a single MR-UAV for different military operations by easily changing parts of the system. This dissertation includes (1) the framework design based on the results of a focus group research with subject matter experts, (2) a process to estimate flight time and optimize flight efficiency, (3) the design of a power management board that allows the MR-UAV to switch from tethered to battery-supplied flight, and (5) an evaluation of the framework through two usability studies.

Examining Committee
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Friday, March 19, 2021
11:00 AM
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THE PUBLIC IS INVITED

Publications

1) **Tezza, Dante**, and Marvin Andujar. "The state-of-the-art of human–drone interaction: A survey." IEEE Access 7 (2019): 167438-167454.
2) **Tezza, Dante**, et al. "Brain eRacing: an exploratory study on virtual brain-controlled drones." International Conference on Human-Computer Interaction. Springer, Cham, 2019.
3) **Tezza, Dante**, Sarah Garcia, and Marvin Andujar. "Let's Learn! An Initial Guide on Using Drones to Teach STEM for Children." International Conference on Human-Computer Interaction. Springer, Cham, 2020.
4) **Tezza, Dante**, et al. "An Analysis of Engagement Levels While Playing Brain-Controlled Games." International Conference on Human-Computer Interaction. Springer, Cham, 2020.
5) **Tezza, Dante,** et al. "Brain-Controlled Drone Racing Game: A Qualitative Analysis." *International Conference on Human-Computer Interaction*. Springer, Cham, 2020.
6) Pham, Tracy**, Dante Tezza**, and Marvin Andujar. "Enhancing Drone Pilots' Engagement Through a Brain-Computer Interface." International Conference on Human-Computer Interaction. Springer, Cham, 2020.
7) **Tezza, Dante**, et al. "Let's Fly! An Analysis of Flying FPV Drones Through an Online Survey." iHDI@ CHI. 2020.
8) **Tezza, Dante,** Denis Laesker, and Marvin Andujar. "The Learning Experience of Becoming a FPV Drone Pilot" ACM/IEEE International Conference on Human-Robot Interaction (HRI '21 Companion).

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