SADEQ ISAAC

PhD ∼ Aerospace / Robotics

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SUMMARY —

Passionate and innovative Robotics Engineer specializing in flight dynamics, control systems, and robotics algorithms. Experienced in designing and developing advanced UAV systems, with a strong foundation in aerospace engineering and hands-on expertise in multi-rotor control, autonomous navigation, and system integration. Committed to advancing cutting-edge technologies in UAV development and contributing to groundbreaking solutions for industrial and research applications.

SKILLS

C++, C#, QML, Python, JavaScript, HTML, Bash, ROS, MATLAB, LaTeX.

Qt, Visual Studio, MCUXpresso, IAR Embedded, Simulink, SolidWorks, Office collection.

English - C1, Spanish - C1, Persian - Native.

EXPERIENCE -

2022 - Present

Wake Engineering S.L., Madrid, Spain

VTOL Solution for Military Fulmar UAV

Wake Engineering S.L., Madrid, Spain

- · Developed a VTOL solution tailored for the military Fulmar UAV.
- Engineered and programmed a resilient Serial/Ethernet communication system to connect avionics, GCS devices, antennas, and UAV using Silvus and Wavenet Radios.
- Led the EUREKA SW project for ship targeting using UAV Gimbals with navigation through maritime environments.
- Innovated an Avionics Plugin in collaboration with UAV Navigation for integration into Visionair software.
 VTOL UAV / Communication Systems / Gimbals

2023 - Present

Ahyres Engineering S.L., Madrid, Spain

GCS Software Interface for Swarm Applications
Abyres S.L., Madrid, Spain

Designed and programmed a user-friendly GCS interface based on QGroundControl.

• Focused on developing efficient control for swarm UAV applications, enhancing communication and coordination between multiple UAVs.

Swarm UAV / QGroundControl / GCS Interfaces

2020 - 2022

Drone-Hopper S.L., Madrid, Spain

WILD-HOPPER UAV Development for Firefighting Operations

Drone-Hopper S.L., Madrid, Spain

- Designed a full controller for the heavy hexa-ducted fan UAV, WILD-HOPPER, using flaps and Electric Ducted Fans (EDFs).
- · Worked on hybrid-propulsion control theory for the QUAD-HOPPER.
- Developed a user interface platform for swarm applications using Qt for FASTER2020 project.

UAV Development / Firefighting Operations / Control Systems

2019 - 2023

__ CAR, UPM, Madrid, Spain

AUKF and MPC for UAV Trajectory Estimation and Control

Polytechnic University of Madrid, Madrid, Spain

- Developed an Adaptive Unscented Kalman Filter (AUKF) to estimate UAV Lemniscate trajectory for MBZIRC 2020 challenge.
- Implemented Model Predictive Control (MPC) on small drones using the Aerostack platform to enhance flight control performance.

Kalman Filter \slash Model Predictive Control \slash UAV Control

2017 - 2018

PROMAK Engineering Company, Tehran, Iran

Advanced GCS Design for Cartographic Air Vehicles PROMAK Engineering Company, Tehran, Iran

• Designed and programmed an advanced GCS for cartographic air vehicles.

 ${\boldsymbol{\cdot}}$ Focused on improving data processing and flight control for UAV-based mapping.

Ground Control Station / Cartographic UAV / Data Processing

2016 - 2018

The Amir Kabir University of Technology, Tehran, Iran

MATLAB Sim-Scape Model and UAV Control Algorithms

The Amir Kabir University of Technology, Tehran

- Built a MATLAB Sim-Scape dynamic model of a quadcopter, comparing sliding and adaptive control algorithms.
- Developed image processing techniques using OpenCV and ROS for UAV systems integration.
- Programmed the Airbus747 simulation in MATLAB/Simulink for flight dynamics analysis.

MATLAB / UAV Control / Image Processing

2014 - 2016

PARS Engineering Company, Tehran, Iran Control Systems and CEP Calculator Design for UAVs

PARS Engineering Company, Tehran

- Designed a control system for Piccolo Cloud Cap Technology, integrating a Communication Box (COMBox) for virtual autopilot operation.
- Developed a Circular Error Probability (CEP) calculator for Monte Carlo simulations and real flight tests.
 Control Systems / Monte Carlo Simulation / UAV Technologies

2012 - 2015

The Khajeh Nasir University of Technology, Tehran, Iran

Pulsejet and Aircraft Design Projects

The Khajeh Nasir University of Technology, Tehran

- · Developed a Pulsejet and studied vortex flows and expansion waves.
- Analyzed aircraft port-wings using Abaqus software, and performed conceptual design of a commercial aircraft using AAA software.
- · Conducted structural analysis on I-beams using Adams and SAP 2000 software.

Pulsejet Design / Aircraft Design / Structural Analysis

EDUCATION -

Sep 2019 - PhD in Automation & Robotics Engineering

Oct 2024

- Specialized in Flight Dynamics, Control, and Robotics Algorithms.
- CAR, Polytechnic University of Madrid (UPM), Spain.
- Thesis: "Control a Multi-Ducted Fan UAV Using Thrust Vectoring."
- Supervisor: Prof. Pascual Campoy (pascual.campoy@upm.es).
- **Grade:** Sobresaliente.

Sep 2016 - MS in Aerospace Engineering

Mar 2019

- Specialized in Flight Dynamics and Control.
- main Amir Kabir University of Technology (Polytechnic), Tehran, Iran.
- Thesis: "Simulation and Implementation of the Landing Phase of a Quadcopter on a Moving Platform."
- Supervisor: Dr. Naghash (naghash@aut.ac.ir).
- **GPA:** 3.6.

Sep 2011 - **BS in Aerospace Engineering**

Sep 2015

- m Khajeh Nasir University of Technology, Tehran, Iran.
- Thesis: "Autopilot Code Programming for a Flying Robot Using C#."
- Supervisor: Prof. Roshanian (roshanian@kntu.ac.ir).
- **GPA**: 3.5.

PUBLICATIONS

Feb 2025

Unmanned Aerial Vehicle-Based Hyperspectral Imaging and Soil Texture Mapping with Robust AI Algorithms

Drones, 2025, 9(2), 129

P. Flores Peña, M.S. Ale Isaac, D. Gîfu, E.M. Pechlivani, A.R. Ragab.

Sep 2024

Advanced Control Strategies for Securing UAV Systems: A Cyber-Physical Approach

Applied System Innovation, 2024, 7(5), 83

M.S. Ale Isaac, P. Flores Peña, D. Gîfu, A.R. Ragab.

Sensing and Control Integration for Thrust Vectoring in Heavy UAVs: Real-World Implementa-Jun 2024 tion and Performance Analysis Unmanned Systems, 2024, 1-23 M.S.A Isaac, P.F. Peña, M.A. Luna, A.R. Ragab, P. Campoy. Thrust Vectoring Control for Heavy UAVs, Employing a Redundant Communication System Jun 2023 Sensors, 2023, 23(12), 5561 Ale. Isaac, M. S., Ragab, A. R., Luna, M. A., Ale Eshagh Khoeini, M. M., and Campoy, P. Nov 2022 A Proposed System for Multi-UAVs in Remote Sensing Operations Sensors, 2022, 22(23), 9180 P. Flores Peña, Luna, M. A., Ragab, Ale. Isaac, M. S., Ragab, A. R., Elmenshawy, A., Martín Gómez, K., Campoy, P., and Molina, M. Medium-Scale UAVs: A Practical Control System Considering Aerodynamics Analysis Sep 2022 Drones, 2022, 6(9), 244 Ale. Isaac, M. S., Luna, M. A., Ragab, A. R., Ale Eshagh Khoeini, M. M., Kalra, R., Campoy, P., and Molina, M. Jun 2022 Wild Hopper: A Heavy-Duty UAV for Day and Night Firefighting Operations Heliyon, 2022, 8(6) Peña, P. F., Ragab, A. R., Luna, M. A., Isaac, M. S. A., & Campoy, P. Fast Multi-UAV Path Planning for Optimal Area Coverage in Aerial Sensing Applications Mar 2022 Sensors, 2022, 22(6), 2297 Luna, M. A., Ale. Isaac, M. S., Ragab, A. R., Campoy, P., Flores Peña, P., and Molina, M. Systemic Integrated Unmanned Aerial System Jan 2022 International Journal of Online & Biomedical Engineering (iJOE), 2022, 18(01) P., Flores Peña, Ragab, A. R., Luna, M. A., Ale. Isaac, M. S. Mathematical Modeling and Designing a Heavy Hybrid-Electric Quadcopter, Controlled by Flaps Nov 2021 Unmanned Systems, 2022, 10(03), 241-253 Ale. Isaac, M. S., Ragab, A. R., Garcés, E. C., Luna, M. A., Peña, P. F., and Cervera, P. C. Sep 2021 **WILD HOPPER Prototype for Forest Firefighting** International Journal of Online and Biomedical Engineering (iJOE), 2021, 17(09) Ahmed Refaat Ragab, Sadeq Isaac, Marco A. Luna, Pablo Flores Peña. Conf. Spiral Coverage Path Planning for Multi-UAV Photovoltaic Panel Inspection Applications Jun 2023 2023 International Conference on Unmanned Aircraft Systems (ICUAS) Luna, M.A., Ale. Isaac, M. S., Fernandez-Cortizas, M., Santos, C., Ragab, A.R., Molina, M., and Campoy, P. Control and Guidance of an Autonomous Quadcopter Landing Phase on a Moving Platform Conf. Sep 2019 11th International Micro Air Vehicle Competition and Conference Ale. Isaac, M. S., Naghash, A., and Mirtajedini, S. Aerospace Engineering, Graduate Exams with Comprehensive Answers Book Sep 2017 Nasir Publication, 2017 Ale. Isaac, M.S., Navizi, A., Abdol-Mohammadi, N., Sepahvand, I., and Sabahi, I. **PROJECTS** Oct 2018 English - C1 TOEFL score 84 (R: 25, L: 20, S: 22, W: 17) Spanish - C1

Persian - Native