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
Ahyres 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 / Model Predictive Control / 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.
- 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 - Oct 2024

PhD in Automation & Robotics Engineering

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 - Mar 2019

MS in Aerospace Engineering

Specialized in Flight Dynamics and Control.

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 - Sep 2015

BS in Aerospace Engineering

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.

Jun 2024 — **Sensing and Control Integration for Thrust Vectoring in Heavy UAVs: Real-World Implementation and Performance Analysis**
Unmanned Systems, 2024, 1-23
M.S.A Isaac, P.F. Peña, M.A. Luna, A.R. Ragab, P. Campoy.

Jun 2023 — **Thrust Vectoring Control for Heavy UAVs, Employing a Redundant Communication System**
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.

Sep 2022 — **Medium-Scale UAVs: A Practical Control System Considering Aerodynamics Analysis**
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.

Mar 2022 — **Fast Multi-UAV Path Planning for Optimal Area Coverage in Aerial Sensing Applications**
Sensors, 2022, 22(6), 2297
Luna, M. A., **Ale. Isaac, M. S.**, Ragab, A. R., Campoy, P., Flores Peña, P., and Molina, M.

Jan 2022 — **Systemic Integrated Unmanned Aerial System**
International Journal of Online & Biomedical Engineering (iJOE), 2022, 18(01)
P., Flores Peña, Ragab, A. R., Luna, M. A., **Ale. Isaac, M. S.**

Nov 2021 — **Mathematical Modeling and Designing a Heavy Hybrid-Electric Quadcopter, Controlled by Flaps**
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. Jun 2023 — **Spiral Coverage Path Planning for Multi-UAV Photovoltaic Panel Inspection Applications**
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.

Conf. Sep 2019 — **Control and Guidance of an Autonomous Quadcopter Landing Phase on a Moving Platform**
11th International Micro Air Vehicle Competition and Conference
Ale. Isaac, M. S., Naghash, A., and Mirtajedini, S.

Book Sep 2017 — **Aerospace Engineering, Graduate Exams with Comprehensive Answers**
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