



# SADEQ ISAAC

PhD ~ Aerospace / Robotics


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 Madrid, Spain

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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.



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



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



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

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](mailto:pascual.campoy@upm.es)).



**Grade:** Sobresaliente.

Sep 2016 -

## MS in Aerospace Engineering

Mar 2019



**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](mailto:naghash@aut.ac.ir)).



**GPA:** 3.6.

Sep 2011 -

## BS in Aerospace Engineering

Sep 2015



Khajeh Nasir University of Technology, Tehran, Iran.



**Thesis:** "Autopilot Code Programming for a Flying Robot Using C#."



**Supervisor:** Prof. Roshanian ([roshanian@kntu.ac.ir](mailto:roshanian@kntu.ac.ir)).



**GPA:** 3.5.

J. Sensors, 2023



### Thrust Vectoring Control for Heavy UAVs, Employing a Redundant Communication System

Ale. Isaac, M. S., Ragab, A. R., Luna, M. A., Ale Eshagh Khoeini, M. M., and Campoy, P.

J. Drones, 2022



### Medium-Scale UAVs: A Practical Control System Considering Aerodynamics Analysis

Ale. Isaac, M. S., Luna, M. A., Ragab, A. R., Ale Eshagh Khoeini, M. M., Kalra, R., Campoy, P., and Molina, M.

J. Sensors, 2022



### Fast Multi-UAV Path Planning for Optimal Area Coverage in Aerial Sensing Applications

Luna, M. A., Ale. Isaac, M. S., Ragab, A. R., Campoy, P., Flores Peña, P., and Molina, M.





J. US, 2022



### Mathematical Modeling and Designing a Heavy Hybrid-Electric Quadcopter, Controlled by Flaps

Ale. Isaac, M. S., Ragab, A. R., Garcés, E. C., Luna, M. A., Peña, P. F., and Cervera, P. C.

J. Heliyon, 2022	 <b>WILD HOPPER: A heavy-duty UAV for day and night firefighting operations</b> Peña, P. F., Ragab, A. R., Luna, M. A., Ale. Isaac, M. S., and Campoy, P.
J. ASI, 2024	 <b>Advanced Control Strategies for Securing UAV Systems: A Cyber-Physical Approach</b> M.S. Ale Isaac, P. Flores Peña, D. Gifu, A.R. Ragab.
J. US, 2024	 <b>Sensing and Control Integration for Thrust Vectoring in Heavy UAVs: Real-World Implementation and Performance Analysis</b> M.S.A Isaac, P.F. Peña, M.A. Luna, A.R. Ragab, P. Campoy.
Conf. IMAV, 2019	 <b>Control and Guidance of an Autonomous Quadcopter Landing Phase on a Moving Platform</b> Ale. Isaac, M. S., Naghash, A., and Mirtajedini, S.
Conf. ICUAS, 2023	 <b>Spiral Coverage Path Planning for Multi-UAV Photovoltaic Panel Inspection Applications</b> Luna, M.A., Ale. Isaac, M. S., Fernandez-Cortizas, M., Santos, C., Ragab, A.R., Molina, M., and Campoy, P.
Conf. ICEET, 2021	 <b>Unmanned Aerial Vehicle Swarming</b> Ragab, A. R., Ale. Isaac, M. S., Luna, M. A., and Peña, P. F.
Book, 2017	 <b>Aerospace Engineering, Graduate Exams with Comprehensive Answers</b> Ale. Isaac, M.S., Navizi, A., Abdol-Mohammadi, N., Sepahvand, I., and Sabahi, I.
2022 – Present	 <b>Wake Engineering S.L., Madrid, Spain</b> <b>VTOL Solution for Military Fulmar UAV</b> <ul style="list-style-type: none"> <li>• Developed a VTOL solution tailored for the military Fulmar UAV.</li> <li>• Engineered and programmed a resilient Serial/Ethernet communication system to connect avionics, GCS devices, antennas, and UAV using Silvus and Wavenet Radios.</li> <li>• Led the EUREKA SW project for ship targeting using UAV Gimbals with navigation through maritime environments.</li> <li>• Innovated an Avionics Plugin in collaboration with UAV Navigation for integration into Visionair software.</li> </ul> VTOL UAV / Communication Systems / Gimbals
2023 – Present	 <b>Ahyres Engineering S.L., Madrid, Spain</b> <b>GCS Software Interface for Swarm Applications</b> <ul style="list-style-type: none"> <li>• Designed and programmed a user-friendly GCS interface based on QGroundControl.</li> <li>• Focused on developing efficient control for swarm UAV applications, enhancing communication and coordination between multiple UAVs.</li> </ul> Swarm UAV / QGroundControl / GCS Interfaces
2020 – 2022	 <b>Drone-Hopper S.L., Madrid, Spain</b> <b>WILD-HOPPER UAV Development for Firefighting Operations</b> <ul style="list-style-type: none"> <li>• Designed a full controller for the heavy hexa-ducted fan UAV, WILD-HOPPER, using flaps and Electric Ducted Fans (EDFs).</li> <li>• Worked on hybrid-propulsion control theory for the QUAD-HOPPER.</li> <li>• Developed a user interface platform for swarm applications using Qt for FASTER2020 project.</li> </ul> UAV Development / Firefighting Operations / Control Systems
2019 – Present	 <b>CAR, UPM, Madrid, Spain</b> <b>AUKF and MPC for UAV Trajectory Estimation and Control</b> <ul style="list-style-type: none"> <li>• Developed an Adaptive Unscented Kalman Filter (AUKF) to estimate UAV Lemniscate trajectory for MBZIRC 2020 challenge.</li> <li>• Implemented Model Predictive Control (MPC) on small drones using the Aerostack platform to enhance flight control performance.</li> </ul> Kalman Filter / Model Predictive Control / UAV Control

- 2017 – 2018  **PROMAK Engineering Company, Tehran, Iran**  
**Advanced GCS Design for Cartographic Air Vehicles**
- 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**
- 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**
- 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**
- 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

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- Oct 2018  **English - C1**  
TOEFL score 84 (R: 25, L: 20, S: 22, W: 17)
-  **Spanish - C1**
-  **Persian - Native**