MOHAMED SALIM FARISSI

Date of birth: 13/10/1990

Nationality: Moroccan

CONTACT

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WORK EXPERIENCE

11/01/2020 – CURRENT – Rome, Italy

Assegno Di Ricerca, SIA-ASI-Development and integration of the SIPU for the SPOT payload

Sapienza University - Scuola Ingegneria Aerospaziale

The Star sensor image on-board Processing for orbiting Objects deTection (SPOT) fits in this field as an innovative space-based autonomous and versatile system for Resident Space Objects' optical detection via star sensors and for different Earth orbits scenarios. The project is being conducted in collaboration with the Italian Space Agency.

The main task is to develop, test, and implement the SPOT algorithms and interfaces on SoC/FPGA.

01/04/2020 – 31/10/2020 – Rome, Italy

Borsa Di Studio Ricerca, Development of the on-board computer based on FPGA for picosatellites

Sapienza University - Scuola Ingegneria Aerospaziale

STECCO (Space Travelling Egg-Controlled Catadioptric Object) is a nanosatellite composed of 6 PocketQube units (5x5x5 cm3) with a total mass of 0.85 kg and an envelope of 5x5x30 cm3. https://sites.google.com/uniroma1.it/stecco-sia/home?authuser=0

I was Responsible for the following:

• The development, testing, and integration of an OBC based on SRAM-FPGA.

• Design, implement, and test the flight software of STECCO.

• Design, implementation, and test of variety and innovative solutions of ADCS.

• The setup of Hardware-In-the-Loop platforms for hardware and software validation. • Writing design reviews and reports.

30/03/2019 – 01/04/2020 – Rome, Italy

Assegno Di Ricerca, Implementation of an active magnetic control system for nanosatellites

Sapienza University - Scuola Ingegneria Aerospaziale

Helmholtz Cage calibration and Active Magnetic Control Design and Testing for CubeSat missions. This setup allows ADCS to be verified, using real on-board systems, evaluating their performance, and indicating eventual design criticalities. Tasks:

• Design and perform the coils and current driver board to produce the desired control action, within the constraints set on the time of operations, power consumption, and electric current.

• Develop and implement de-tumbling and a pointing control algorithm on FPGA.

• Setup and development of Hardware in the loop, using System Generator, to verify the performance and robustness of the control algorithms and simulate critical scenarios.

• Implement a PID control algorithm to drive the Helmholtz cage facility to accurately recreate the magnetic field along the spacecraft orbit.

• Calibrate and verify the magnetometer by using Least Square Method and Helmholtz cage facility.

EDUCATION AND TRAINING

30/06/2009 – Taza, Morocco

High School
Technical High School

Address Taza, Morocco

01/09/2009 – 30/06/2011 – Oujda, Morocco

Classes préparatoires aux grandes écoles
Omar Ibn Abdulaziz School

Address Oujda, Morocco

01/10/2011 – 01/10/2014 – Fez, Morocco

Engineering degree in Electronic Systems and Telecommunications
Moulay Ben Abdellah University, Faculty of Sciences and Technologies

Address Fez, Morocco

10/09/2016 – 13/12/2018 – Rome, Italy

Special master's in aerospace engineering
Sapienza University of Rome -Scuola Di Ingegneria Aerospaziale (SIA)

Address Rome, Italy

LANGUAGE SKILLS

MOTHER TONGUE(S): Arabic | Berber languages

OTHER LANGUAGE(S):

French

Listening	Reading	Spoken production	Spoken interaction	Writing
C2	C2	B2	C1	B2

English

Listening	Reading	Spoken production	Spoken interaction	Writing
C1	C1	B2	B2	B2

Italian

Listening	Reading	Spoken production	Spoken interaction	Writing
B1	B1	A2	A2	A1

PUBLICATIONS

Implementation and Hardware-In-The Loop Simulation of a Magnetic Detumbling and Pointing Control Based on Three-Axis Magnetometer Data

2019 https://doi.org/10.3390/aerospace6120133
Aerospace

- **A Magnetometer-Only Attitude Determination Strategy for Small Satellites: Design of the Algorithm and Hardware-in-the-Loop Testing**

  2020 https://doi.org/10.3390/aerospace7010003
  Aerospace

CONFERENCES AND SEMINARS

- **21/10/2019 – 25/10/2019** > – 70th International Astronautical Congress, Washington, D.C

- **Design And Hardware-In-The-Loop Test of an Active Magnetic Detumbling and Pointing Control Based Only on Three-Axis Magnetometer Data**

- **28/01/2020 – 31/01/2020** > – 5th IAA Conference on University Satellite Missions and CubeSat Workshop, Rome

- **An Innovative Implementation of the TRIAD and EKF Algorithms on FPGA using Systolic Array Architecture for Real-Time Attitude Determination**

- **28/01/2020 – 31/01/2020** > – 5th IAA Conference on University Satellite Missions and CubeSat Workshop, Rome

- **On-Board Computer Based on SRAM FPGA for PocketQube Missions**

- **25/10/2021 – 29/10/2021** > – 72nd International Astronautical Congress Dubai, United Arab Emirates

- **Hardware implementation of the SPOT Payload for Orbiting Objects Detection using Star Sensors**

- **08/2022** > – 2022 AAS/AIAA Astrodynamics Specialist Conference, Charlotte, North Carolina, USA

- **RESIDENT SPACE OBJECTS DETECTION AND TRACKING BASED ON ARTIFICIAL INTELLIGENCE**

- **08/2022** > – 2022 AAS/AIAA Astrodynamics Specialist Conference, Charlotte, North Carolina, USA

- **REAL-TIME IMAGE PROCESSING IMPLEMENTATION FOR ON-BOARD OBJECT DETECTION AND TRACKING**

- **01/09/2022 – 03/09/2022** > – 2nd International Conference on Applied Intelligence and Informatics 2022, Reggio Calabria, Italy

- **Hardware-in-the-loop simulations of future autonomous space systems aided by artificial intelligence**

SKILLS

- **Aerospace**

  ADCS, GNC, electronics for space systems, robotic systems, aerospace trajectories, Formation flying.

- **Electronics**

  SoC, FPGA, MCU, design, and construction of PCB, embedded system, VLSI, communication peripherals (I 2 C, SPI, UART, AXI MABA).

- **Telecommunications**

  Optical communication, source and channel coding, signal/image processing, radio frequency communication, SDR.

- **Programming Languages**

  VHDL, SystemVerilog (UVM), TCL, C/C++, Embedded C.

- **Software**

  Matlab, Simulink, System Generator, Vivado, HLS, SDK, ModelSim, WrightRapid, Altium, Code Composer Studio, Arduino, GNU Radio.

COMMUNICATION AND INTERPERSONAL SKILLS

Personal capacity

Sense of responsibility, work motivation, and professionalism.

Good capacity for learning and applying new techniques.

Rigorous, punctual, and tireless.

Autonomous and able to work in a multidisciplinary team.