Training Opportunity for Luxembourgish Trainees

Reference	Title	Duty Station
LU-2021-TEC-EDD	**On-Board Computer and Data Handling Systems**	**ESTEC**

Overview of the mission:

The Data Systems, Microelectronics and Component Technology Division carries out all the tasks related to ESA project support and technology development activities in its area of responsibility. This includes on-board computers and data-handling systems (such as mass memories and instrument control units) for payloads and platforms, microelectronics (such as FPGAs and ASICs), Artificial Neural Networks, AI and Machine learning, cubesat activities, wireless technologies and all technologies related to the EEE component family (such as Si, photonics, passives). In terms of technology development, we seek to develop state-of-the-art technologies to support future ESA space missions in space science, Earth observation, human spaceflight, telecommunication, navigation, space transportation, operations and space engineering and technology.

The On-Board Computer & Data Handling Section provides functional support to ESA projects and carries out technological research (R&D) what concerns turn-key on-board HW Data Handling solutions with emphasis on:

- platform and payload data handling architectures and their building blocks (equipment/units, modules and key components);
- units such as on-board computers, mass memories, remote terminals, instrument control units*;
- digital and analogue signal processing electronics for payload/platform functions;
- front-end acquisition and processing chain electronics*;
- on-board data transfer interfaces, buses and associated protocols (high and low speed);
- platform data handling functions related to security, data authentication, encryption, compression;
- use of microelectronics devices.
- implementation, inference, verification and validation of algorithms** on processing HW platforms for space applications* in close collaboration with other discipline experts (software, microelectronics and applications engineers).

* except for RF payloads.
** including Artificial Intelligence and Machine Learning algorithms.

Overview of the field of activity proposed:

As part of the On-Board Computer & Data Handling Section, you will provide support to the section's lab activities performed in the ESTEC avionics lab to:

- characterise and test the laboratory flat cube-sat
- design, build, and test new processing boards, to be then integrated and tested on the laboratory flat-sat
- design, build, and test medium- and high-speed link experiments
- design, build, and test Artificial Intelligence/Machine-Learning experiments
- design, build, and test Artificial Neural Network machine solutions for a specific targeted application
- test and characterise circuitries based on commercial off-the-shelf (COTS) digital components.
- combine above technologies to build, and test a new concept of On Board computer

This training opportunity will provide hands-on hardware and software development experience.

Required education and skills:

- Master's degree in electronics, electrical engineering, networks, telecommunications or a related field is required

- Good interpersonal and communication skills

- Ability to work in a multi-cultural environment, both independently and as part of a team

- Fluency in English and/or French, the working languages of the Agency