

Training Opportunity for Luxembourgish Trainees

Reference	Title	Duty Station
LU-2019-TEC-EDD(1)	Demonstration and verification of Visual Based Navigation applications	TEC-EDD

Overview of the unit's mission:

The Section's domain of responsibility covers control and data handling computers, low-level software, data transfer interfaces, command & control protocols and buses, OBC solid state mass memories, authentication/encryption modules, and general underlying microelectronics devices such as microcontrollers and interface components.

Overview of the field of activity proposed:

Visual Based navigation (VBN) is foreseen for different missions as for example debris removal, in-orbit servicing, landing, sample capture. VBN implies image processing which is demanding and is not supported in real-time using existing technologies. Lately TEC-EDD section started lab activities, which address the impact on the OBC architecture to support real-time processing for VBN related missions, with the goal to result to a common architecture covering different mission needs. An advantage of the proposed architecture is the reuse of resources for different mission phases (e.g. reuse VBN co-processor for different tasks in different mission phases), which results in savings in cost, mass, power.

Towards this direction, TEC-EDD is running a lab activity, which will provide a proof of concept demonstration for debris removal applications and will deliver a testbed for its extension to other application areas. The proposed activity herein has the goal to reuse the same architecture for other missions and/or mission phases such as sample capture, docking/in-orbit servicing or landing, in which real-time image processing is strictly necessary (e.g. identification of landscape, avoidance of boulders etc. using cameras and/or LIDARs for landing).

The candidate will contribute to the following:

- The definition of requirements for VBN related applications
- The design and implementation of the SW that will execute on the aforementioned testbed
- The design and definition of the verification environment
- The verification of the developed applications using third party tools (e.g. PANGU SW for landing)
- Dissemination of the results inside the agency (presentations, design/test reports etc.).

Required education:

Applicants should have just completed, or be in their final year of a University course at Masters Level (or equivalent) in a technical or scientific discipline with specialisation on Electronics and with background on Software domain.