Training Opportunity for Luxembourgish Trainees

Reference	Title	Duty Station
LU-2022- TEC-ESS	**Systems Security Engineering**	**ESTEC**

Overview of the mission

The Systems Security Engineering Section, in full respect and compliance with the ESA Security Framework, covers the security engineering processes, the techniques and technologies, dealing with the security of systems from the End-to End (E2E) point of view, the subsystem, the elements and equipment contributing or implementing specific detection/mitigation and protection measures, the analysis and methodology for vulnerability and risk assessments, the accreditation, certification processes and standards, including system design tools and equipment.

Overview of the field of activity proposed

As a national trainee in the systems security engineering section, you will work together with an interdisciplinary team of security experts covering a wide range of the systems security engineering domain. You will work in a cyber lab participating in the development of security assessment tools and a system test bed suitable to test, from a security and performance perspective, Post Quantum Cryptographic (PQC) algorithms into space protocols like SDLS CCSDS (ccsds.org). Guided and supervised by experts on the field, you will learn everything about space protocols, you will learn to implement them in software using Python, you will learn all about _applied_ Post Quantum Cryptography and how it is meant to be used in modern protocol (e.g. IKEv2/IPSec, TLS, etc.), and eventually how to integrate PQC in space protocols. Then, by working hands-on in a lab, all the above will be implemented and tested in a testbed, assessing their suitability, performance, and security against various scenarios.

This will be an innovative activity, which will combine learning in modern fields like Post quantum cryptography, cyber security and hands-on experience. Depending on the progress being made during the traineeship, the work could end up in a scientific publication.
The above activity can be extended and followed by further security and vulnerability assessments for various segments and elements of space systems.

Furthermore, in parallel to the above you will have the chance to participate to some relevant and exciting ESA projects (in the domain of security, telecom, or other), learn how ESA projects are being engineered from a systems point of view during their whole lifecycle (SRR, PDR, CDR, etc.) and eventually even contribute to them by providing your feedback, recommendations, etc.
At the end of the traineeship, on top of the acquired technical knowledge on the aforementioned fields, you will also have a very good view of how systems engineering works at ESA, with an emphasis on security.

Required background
- Master's degree in cyber security or computer science
- Technical knowledge in TCP/IP stack, Python, modern Operating Systems and virtualisation.
- 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