2020 TRAINING
Mission Studies for Space Applications

Training title: *Innovative Mission concepts and tools for satellite constellations*

Field: Research and Development, Computer science, Software design and development, System engineering, Modelling and Simulation

Diploma: Engineering degree, Master of Science

Company background

Airbus Defence & Space, Space Systems, is the European leader in the field of optical Earth Observation systems. It is the pioneer company responsible for the development of the first Earth Observation space systems in Europe, starting with the SPOT family. Since this time, it has led the major European developments in those fields, through programs for space agencies, export solutions, or Airbus's own very-high resolution (VHR) earth observation satellites.

This evolution has allowed Airbus to develop a strong expertise in Mission Planning and Mission Analysis through the Mission Chain Department (TESUM). The department has grown significantly in recent years and now relies on about a hundred engineers.

Subject

The mission of Earth Observation satellites is to acquire images in response to requests coming from various users. Mission planning consists in computing the set of actions to be performed by the satellite at all times, according to the request properties and the system limitations: agility, on-board memory, download capacity...

With the development and launch of more and more Earth Observation satellites, the possibility to interoperate the different systems is becoming a major requirement for new programs. These interfaces enable to reduce acquisition delays for urgent requests, distribute workload and reduce revisit delays between acquisitions.

This trend leads to new challenges for efficiently operating these multiple systems. Our products, tools and methodologies must follow this trend. This has led to an interesting innovation plan that allows us to anticipate the future needs and invest in the correct analysis and tools.

Internship description

Depending on the context and trainee profile, the internship will explore, prototype and innovate new tools, functionalities or concepts for Earth observation satellites and constellations:

- Review and model chronologies of Earth Observation system offering tasking services to Airbus DS (Pléiades, Pléiades NEO, TerraSAR-X, PAZ, WorldView, Cosmo-Skymed, Sentinel...) before analysing the integration of inter-tasking options in our products.
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- Research, prototype and validate a GUI plugin for easily tasking multiple satellites with our Mission Chain product lines.
- Research, implement and validate improvement axes of our current System and Software Simulation/Validation tool to integrate the future needs of the Earth Observation business (constellations, interoperability...)

Tasks and accountabilities

After having familiarized with the context, the trainee shall:

- Understand and assess existing concept analysis or software products,
- Query the teams to collect needs and recommendations,
- Search in literature for state of the art technologies and approaches
- Prototype, implement and validate the selected solution(s) with the operational team
- Organize, plan and report the activities – work in connection with Mission experts and engineers – communicate results to the other team members.

Required skills

- Background in software development, system engineering and validation.
- Software development Skills: python, java, angular...
- Good capacity to take initiative, interact with other team members, report and advance autonomously.
- French or English: negotiation level.
- Background or strong interest in space systems.

You are a good team player and have excellent interpersonal skills.

Desired education

- Engineering school or Master

Training duration
6 months in 2020 – Ideally starting between February and May

Training Location
Airbus Defence & Space
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