REF: 10424252

Training title: Simulator for image and video data processing pipeline

Field: Operations and R&D
Speciality: Software development

Subject

The Sensor Processing Chain department designs and develops image processing chains for earth observation satellites. The volume of data produced by new generation satellites is dramatically increasing. To deal with this amount of data, our processing chains are based on latest Cloud and Big Data technologies, such as Apache Spark, Flink and Kafka.

Within this context, we recently designed a set of tools that simulate data processing pipelines, for both image processing and video processing. They provide metrics about performance (throughput, latency) and resource consumption of the processing chains. These tools are developed in Java and Python, and rely on the same big data frameworks as the processing chains.

This training is about improving these simulation tools, such as:
- adding new operators to be able to express more complex pipelines,
- improve data metrics and visualization tools
- integrate these tools in our product line, to improve our ability to maintain our processing pipelines
- study how our simulation tools relates to other simulation tools used in the company, especially the ones used at an upper system level.

Company background

The Space System business line of Airbus Defence & Space is the European leader in the field of optical Earth Observation systems. The company, through is history, is a pioneer of space industry, responsible for the development of the first Earth Observation space systems in Europe, starting with the SPOT family. Since this time, the company has led the major European developments in the fields, through programs such as METOP, ERS, ENVISAT, HELIOS, PLEIADES or SPOT6. This experience developed is now applied on export turn-key programs such as FORMOSAT, THEOS, ALSAT, CHILI, KazEOSat-1 or PeruSat, involving up to sub metric resolution systems, or such as COMS, a geostationary meteorological satellite for Korea.

This evolution conveyed Airbus Defence & Space to develop a strong expertise in Image Quality, Image Processing and Image Simulation through a group of about 80 engineers in 2017, constituting the Image Chain department (TESUI). The Image team carries out activities in fundamental image domains such as image simulation, ground processing, image quality, in-orbit testing, embedded processing, vision-based navigation and dedicated R&D activities.
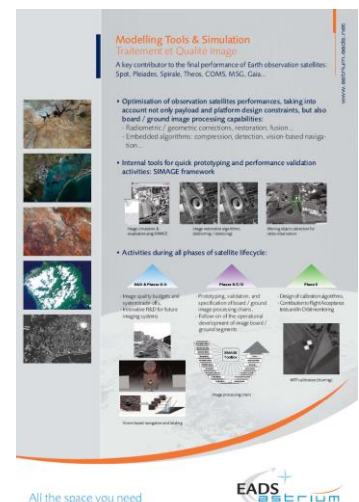
Required knowledge
- Linux operating systems (intermediate/advanced)
- Java and Python programming (intermediate/advanced)

- Big data framework, functional programming (intermediate)
- Autonomous and willing to communicate with several interlocutors to gather information
- Interested in massive data processing
- Cloud computing

Appreciated knowledge, but not mandatory:
- C++ programming
- modelling frameworks and tools such as Eclipse Modeling Framework and Jetbrains MPS

Desired education
- Engineering school or Master in software development
- Engineering school or Master, with specialisation in signal and image processing, or applied mathematics.

Training period length: **5 to 6 months in 2019**

Location	Airbus Defence & Space – Space Systems
	31 rue des cosmonautes 31402 **Toulouse** Cedex 4, **France**
Unit	TESUI – Sensor Processing Chain department
Deadline	15/12/2018
Contact	**stages-image-airbus@airbus.com**