EUROPEAN SPACE AGENCY

On-Board Payload Data Processing Engineer

Job Req ID: 12164
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Date Posted: 12 June 2021

Vacancy in the Directorate of Technology, Engineering and Quality.

ESA is an equal opportunity employer, committed to achieving diversity within the workforce and creating an inclusive working environment. For this purpose, we welcome applications from all qualified candidates irrespective of gender, sexual orientation, ethnicity, beliefs, age, disability or other characteristics. Applications from women are encouraged.

This post is classified A2-A4 on the Coordinated Organisations' salary scale.

Location
ESTEC, Noordwijk, The Netherlands

Description
On-board Payload Data Processing Engineer in the Radio Frequency (RF) Digital Equipment and Payload Data Processing Section, RF Payloads and Technology Division, Electrical Department, Directorate of Technology, Engineering and Quality.

The RF Digital Equipment and Payload Data Processing Section provides functional support to ESA projects and carries out technology research (R&D) in on-board payload data processing and RF digital equipment as applied to remote-sensing instruments, navigation and telecommunication payloads.

Duties
We are looking to fill one post. However, we would consider candidates with the background in either of the two profiles mentioned below.

Profile 1: RF Instrument On-Board Data Processing Engineer
You will be required to carry out a diverse range of support tasks such as: algorithmic and hardware definition, development and validation, involving software, hardware and system constraints. These can be grouped under the following main headings:
- Design, development and performance evaluation and characterisation of control, data and signal processing units for RF payloads and instruments.
- Definition, design, development, performance evaluation and verification of data and signal processing functions and algorithms via simulation techniques (e.g. MATLAB, Python, prototyping SW).
- Design, verification and validation of payload data and signal processing chains.
- Hardware/software optimisation and implementation of payload data processing functions on processors (e.g. uC/uP, DSP, GPU, AI accelerators) and FPGA-based (e.g. MPSoC, RfSoC) platforms.

- RF payload/instrument-related ASICs and device specification/validation.
- Specific engineering support in the above areas for mainstream ESA space projects, mainly for (but not restricted to) development and testing phases.

Profile 2: Optical Instrument On-Board Image Processing Engineer
You will be required to carry out a diverse range of support tasks such as: algorithmic definition, development and validation, involving software, hardware and system constraints. These tasks are expected to address processing functions focusing on payload performance (image quality), data compression/reduction and data analysis. They can be grouped under the following main headings:
- Analysis of system-level needs and definition of system and subsystem requirement specifications for optical payload processing functions.
- Definition, design, development, performance evaluation and verification of image processing functions and algorithms via simulation techniques (e.g. MATLAB, Python, prototyping SW).
- Design, verification and validation of payload image processing chains (in close collaboration with teams responsible for SW and HW implementation).
- Support for HW/SW optimisation and implementation of payload data processing functions on processors (e.g. uC/uP, DSP, GPU, AI accelerators) and FPGA-based platforms.
- Specific engineering support in the above areas to mainstream ESA space projects, mainly for (but not restricted to) development and testing phases.

Technical competencies
- General background and specific experience in the technical domains covered by the position
- Experience in the development and verification of space hardware
- Hands-on hardware experience
- Experience with the design, development and application of relevant tools and methods
- Understanding of related technologies, R&D trends and the industrial landscape
- Experience in the preparation of procurement activities for technology development and innovation (statements of work, proposal evaluation, etc)
- Experience in the management and monitoring of industrial activities, including participation in reviews

Behavioural competencies
Result Orientation
Operational Efficiency
Fostering Cooperation
Relationship Management
Continuous Improvement
Forward Thinking

Education
A Master's degree in signal processing, electronics or telecommunications for this post is required.

Additional requirements
Profile 1: RF Instrument On-Board Data Processing Engineer
- Extensive knowledge of on-board data and signal processing techniques.

- Extensive knowledge of signal quality and on-board payload data processing functions for RF remote sensing and telecom payloads.
- Extensive knowledge of simulation of signal processing functions (MATLAB, Python, C, etc.).
- Knowledge of design, training and validation of machine learning techniques (not limited to deep learning) for tasks such as prediction, classification, semantic segmentation, and object detection.
- Familiarity with telecom payload processors, synthetic aperture radar, radar altimetry and radio frequency interference mitigation (more than one of these will be a strong asset).
- Familiarity with payload data and signal processing on-board system architectures.
- Familiarity with processing devices and on-board electronics design related to data acquisition and processing functions.
- Familiarity with procurement of units, subsystem integration and testing.
- Ability to work in an autonomous manner, in particular when providing support to projects with high time allocations, in coordination with the line manager.

Profile 2: Optical Instrument On-Board Image Processing Engineer
- Extensive knowledge of image processing, compression and computer vision techniques.
- Extensive knowledge of optical imaging payloads, signal/image quality and on-board payload data processing functions.
- Extensive knowledge of simulation of image processing functions (MATLAB, Python, ENVI/IDL, C, etc.).
- Knowledge of design, training and validation of machine learning techniques (not limited to deep learning) for tasks such as prediction, classification, semantic segmentation, and object detection.
- Familiarity with computational imaging techniques (image stabilisation, super-resolution, active optics, etc.).
- Familiarity with payload data processing on-board system architectures.
- Familiarity with processing devices and on-board electronics design related to data acquisition and processing functions.
- Familiarity with procurement of demonstrator units, subsystem integration and testing.
- Ability to work in an autonomous manner, in particular when providing support to projects with high time allocations, in coordination with the line manager.

Profile independent assets:
You will possess very good knowledge of one of the following: on-board digital signal processing techniques and technologies for optical, radio frequency and microwave payloads. Experience in several will be considered an asset.

The following will be considered an asset:
- Very good knowledge of artificial intelligence as applied to on-board payload data processing.
- Professional experience in on-board image processing.
- Professional experience in ASIC and FPGA specification, design and verification.
- Experience in payload data handling.
- Some years of professional experience in the technical domains required for this position.

Other information
For behavioural competencies expected from ESA staff in general, please refer to the ESA Competency Framework.

The working languages of the Agency are English and French. A good knowledge of one of these is required. Knowledge of another Member State language would be an asset.

The Agency may require applicants to undergo selection tests.

The closing date for applications is 10 July 2021.

At the Agency we value diversity and we welcome people with disabilities. Whenever possible, we seek to accommodate individuals with disabilities by providing the necessary support at the workplace. The Human Resources Department can also provide assistance during the recruitment process. If you would like to discuss this further please contact us at contact.human.resources@esa.int.

Please note that applications are only considered from nationals of one of the following States: Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, the United Kingdom and Canada, Latvia and Slovenia.

According to the ESA Convention the recruitment of staff must take into account an adequate distribution of posts among nationals of the ESA Member States. When short-listing for an interview, priority will first be given to internal candidates and secondly to external candidates from under-represented Member States.
(https://esamultimedia.esa.int/docs/careers/NationalityTargets.pdf)

In accordance with the European Space Agency's security procedures and as part of the selection process, successful candidates will be required to undergo basic screening before appointment.

Recruitment will normally be at the first grade in the band (A2); however, if the candidate selected has little or no experience, the position may be filled at A1 level.