EUROPEAN SPACE AGENCY

Guidance Navigation and Control (GNC) System Engineer

Job Req ID: 15007

Closing Date: 29 March 2022

Publication: Internal & External

Vacancy Type: Permanent

Date Posted: 01 March 2022

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. We therefore 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, Netherlands

Description

Guidance Navigation and Control System Engineer in the Guidance Navigation and Control Section, GNC, AOCS and Pointing Division, Systems Department, Directorate of Technology, Engineering and Quality.

The Guidance Navigation and Control Section provides functional support to ESA projects in the technical field of GNC systems for: planetary exploration orbiters and landers, launch and transportation systems, re-entry vehicles, new generation space vehicles for in-orbit robotic operations (including in-orbit servicing, in-orbit assembly, debris removal) and specialised applications such as rendezvous and formation flying.

The Guidance Navigation and Control Section carries out technology research in the field of GNC systems for: space vehicles including interplanetary cruise, aero-assistance, precision landing, ascent, rendezvous and docking, re-entry, formation flying and drag-free systems. This covers in particular autonomous and fault-tolerant systems (including Health Monitoring Systems), advanced guidance, control, estimation and optimisation techniques and tools, as well as the technology development of GNC sensors with the focus on vision-based navigation and hybrid navigation concepts.

Duties

You will report to the Head of Section and, within the above technical fields, your main tasks and responsibilities will include:

- providing expert technical support and consultancy to ESA projects, programmes and general studies in the area of GNC requirements analysis and trade-offs (for system, software and hardware units), GNC performance analysis and budgeting, GNC system, software and unit procurement, GNC system verification and validation throughout all project phases, including GNC Fault Detection Isolation and Recovery (FDIR);
- participating in feasibility studies (including Phase 0 in the ESA Concurrent Design Facility), project reviews and the evaluation of procurement proposals;
- identifying critical development problems and assisting in their resolution;
- contributing to the definition of technology development requirements and work plans for the Agency's technology programmes;
- defining, initiating and managing R&D activities covering both long- and short-term needs and addressing mission-enabling GNC system concepts as well as mathematical modelling, multi-physics simulation of complex spacecraft dynamics, advanced guidance, control, estimation and optimisation techniques and tools;
- fostering new application areas for multidisciplinary activities, with the emphasis on innovative concepts, cutting-edge technologies and system architectures;
- laboratory activities for the evaluation and prototyping of new GNC systems and sensors, as required;
- monitoring applicable scientific and technological trends and maintaining state-of-the-art expertise;
- contributing to dissemination of the results of activities performed and the transfer of knowledge across the Agency.

Duties may also include supporting other activities within your area of competence.

Technical competencies

Understanding of related technologies, R&D trends and familiarity with the industrial landscape

Project support experience in a relevant domain

Experience with laboratory and field testing of relevant technical equipment

Experience in preparation of procurement activities for technology development and innovation (statements of work, proposal evaluation)

Experience in the management and monitoring of industrial activities, including participation in reviews

General background and experience in the technical domains covered by the position

Behavioural competencies

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

Education

A master's degree in control or aerospace engineering is required.

Additional requirements

Proven experience in the development (design, analysis, simulation, testing) of GNC systems for space transportation, planetary science missions and/or exploration missions.

Preference will be given to those with proven expertise in two or more of the following areas related to the position:

- Dynamics and guidance of space transportation systems (atmospheric and/or orbital flight), interplanetary spacecraft, and/or landers in planetary or other space environments (Moon, asteroids, etc.);
- Methods and principles for local and global optimisation of space trajectories;
- Relative navigation technology (sensors and techniques, including data fusion) for space systems;
- Mathematical modelling and multi-physics/multi-domain simulation techniques;
- Classical as well as advanced (robust, adaptive, non-linear) control and filtering techniques;
- Control-structure interaction mitigation systems for orbital and/or space transportation vehicles;
- Familiarity with machine learning techniques and their application to mission-critical or safety-critical systems.

Other information

For behavioural competencies expected from ESA staff in general, please refer to the ESA Competency Framework.
For further information please visit: Professionals, What we offer and FAQ

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.

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 email 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, Lithuania 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 or balanced 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 conducted by an external background screening service.

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.
*Member States, Associate Members or Cooperating States.