Internship in Satellite System Ground Segments Division

Internship title: Scanning Techniques for EUMETSAT GEO network antennas to estimate spacecraft position

The need to accurately point the ground stations' antennas and to effectively track spacecraft's trajectories is fundamental to maximise the performance of the radiofrequency links.

The spacecraft trajectory (its position versus time) is typically known with high accuracy, and this trajectory is programmed into the antenna. However, due to environmental disturbances, such as temperature gradient, gravity forces, and manufacturing imperfections, the antenna does not point precisely towards the spacecraft. A technique commonly used for the determination of the true spacecraft position is the conical scanning (conscan) method. During conscan, circular movements are added to the antenna commanded trajectory. These circular movements cause sinusoidal variations in the power of the signal received from the spacecraft by the antenna, and these variations are used to estimate the true spacecraft position.

The purpose of this internship is to study and analyse through simulations and ad-hoc software tools the potential performance of antenna conical scan methods when pointing the antenna to a virtual position in the plane of sky between two GEO spacecraft.

Duties

The new S/W simulation tools (mainly MatLab and/or C++) shall be developed or tailored to allow parameterisation of the different scenarios, including degraded cases. This internship will provide students with the possibility to put in practice several different signal processing techniques learnt at university. After an initial period of familiarisation with EUMETSAT and the particularities of EUMETSAT's MSG and MTG operational

- Analyse the feasibility and expected performance of the conscan techniques when applied to the tracking of MSG or MTG spacecraft in the case of one or two spacecraft per aperture;
- Generate a set of operational and non-operational scenarios aiming at measuring the performance margins of the new tracking technique when used for

LOCATION

Darmstadt, Germany

QUALIFICATIONS

The internships are open to bachelor and master students with mandatory internship requirements in relevant disciplines such as Telecommunication.

LANGUAGES

The official languages of EUMETSAT are English and French. It is necessary to be able to work effectively in English.

DEADLINE

3 November 2025

tracking techniques, the trainee should go through the following steps:

- Review existing EUMETSAT's GEO network antenna pointing and tracking technical documentation (including operational principles);
- Familiarisation with the technical documentation addressing conical scan an alike technique;
- one or two spacecraft;
- Generate (MatLab and/or C++) the required test tools in order to run the selected operational and non-operational scenarios;
- Evaluate the performance of such systems under the different scenarios;
- Generate corresponding reports and Technical Notes Generate along with a final technical report.

Skills and Experience

- Have the ability to work effectively in English;
- Be computer literate;
- Be intrinsically motivated and curious about the internship subject;
- Be able to work independently and collaboratively;
- Have the ability to take the initiative in researching ideas;
- Have the ability to collect, collate, conceptualize and present information clearly.

Additional specific requirements:

- Good understanding of modern signal processing techniques;
- Good understanding of space telecommunications systems;
- Practical experience in either C, C++ or MatLab;
- Practical experience in reading and assessing technical documentation.

Employment Conditions

Length of internship: **6 months**
Anticipated start date: **2026**

The internship will require a non-disclosure agreement and potentially a basic background check for the intern, due to the sensitivity of the provided information.

No salary is paid to interns who are still in studies, however a daily allowance and contribution to travel / accommodation costs may be provided.

As of 1 January 2026, interns may be granted a daily allowance of EUR 25 per day, relocation cost reimbursement of up to EUR 400, and accommodation cost reimbursement of up to EUR 1000 per month.

Interns are responsible for providing their own health and accident insurance and for finding their own accommodation in Darmstadt.

Consideration may also be given if the internship is not a mandatory part of curriculum, for a maximum duration of three months.

EUMETSAT is committed to providing an equal opportunities work environment for men and women.
Please note that only nationals of EUMETSAT Member States may apply. The EUMETSAT Convention requires that Staff shall be recruited on the basis of their qualifications, account being taken of the international character of EUMETSAT.

About EUMETSAT

EUMETSAT is Europe's meteorological satellite agency. Its role is to establish and operate meteorological satellites to monitor the weather and climate from space - 24 hours a day, 365 days a year. This information is supplied to the National Meteorological Services of the organisation's Member States in Europe, as well as other users worldwide.

EUMETSAT also operates several Copernicus missions on behalf of the European Union and provide data services to the Copernicus marine and atmospheric services and their users.

As an intergovernmental European Organisation, EUMETSAT has 30 Member States (Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, The Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.)

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