

Training Opportunity for Portuguese Trainees

Reference	Specialist Area	Duty Station
PT-2010-TEC-ETN(1)	Radio-navigation Receivers Techniques	ESTEC
<p><u>Overview of the Division missions:</u> The RF Payload Systems Division is responsible for space instrumentation and communication systems, subsystems, equipment and technologies. This covers:</p> <ul style="list-style-type: none"> • Communication systems and subsystems design and validation; • Radio Navigation systems, subsystems and equipment (GPS, EGNOS, GALILEO); • Systems for TT&C communication, remote sensing and scientific applications; • Satellite payloads (e.g. repeaters for telecommunications or navigation instruments for earth remote sensing or scientific applications) • Microwave and millimetre wave equipment and technologies; • Complex on-board payloads for communications and remote sensing, and processing core of such systems, including optically based implementations; • Systems testing for performance evaluation or validation. <p>The expertise of the Division is essentially used for :</p> <ul style="list-style-type: none"> • Preparation and implementation of various ESA R&D programmes • Support to ESA projects • Consultancy to customers outside ESA • Training and supervision of students, graduates, research fellows • European Standardisation of technologies • Organization of workshops and conferences <p>The trainee will be integrated into the Radio Navigation Systems and Techniques Section. The section is involved in:</p> <ul style="list-style-type: none"> • Radio navigation systems studies • Support to the EGNOS and Galileo projects for system design, development and testing • Advanced research and development in the field of radio navigation techniques and technologies <p>Development of receivers for GPS, EGNOS and Galileo</p>		
<p><u>Overview of the field of activity proposed:</u> Radio-navigation receivers techniques development prototyping and testing. The possibility to extend the usage of Radio-navigation receivers to more and more Challenging User environment (INDOOR, Urban, suburban, etc.), is linked to the capability of effectively mitigating the impact of interference and multipath, which are the dominating effects. Continuous effort is therefore put in research on advanced Navigation and Signal processing techniques for Data/Acquisition and Tracking (Channel estimators, Adaptive filtering etc.) trying to capitalize on the feature of the latest Signal in Space and the redundancy of Multi-Constellation GNSS. Fundamental aspect is also the performance verification under realistic channel conditions. Adaptive Beam-forming Receiver Algorithm Beam-forming Techniques for GNSS Sensor stations Receiver/Antenna processing are being studied today to mitigate the impact of Multipath and Interference and improve the accuracy of the monitoring network. Development of techniques, comparison of various algorithms is a work which is still ongoing in order to optimise the performance and trade off the complexity with the accuracy/robustness. The trainee will work in the following areas:</p> <ul style="list-style-type: none"> • Analysis and development of algorithm for advanced Beam-forming techniques • Analysis and development of algorithm for advanced Navigation and Signal processing techniques • Prototyping of critical functionalities in Matlab and C/C++ • Lab testing of prototyped functionalities and receivers in the European Navigation Lab at ESTEC 		
<p><u>Required Education:</u> Degree in Telecommunications Engineering or similar. C/C++ and Matlab programming ability. Previous contact with a radiofrequency lab would be desirable. Previous knowledge of radionavigation would be desirable. Background in Signal processing would be desirable</p>		