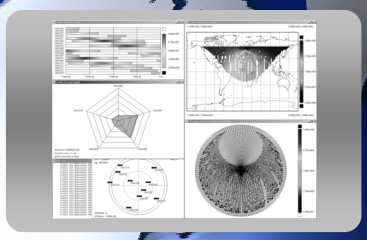
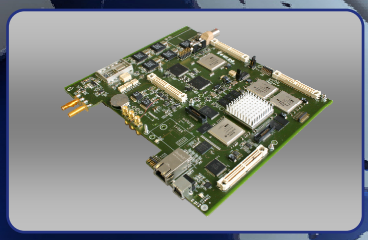
Opportunity for

Master Thesis (6 Months)


Receiver Technologies

Processing of the QZSS LEX Signal and of Generic CSK Schemes in a Satellite Navigation Receiver

Thesis Summary

The Quasi-Zenith Satellite System (QZSS) is a regional navigation satellite system developed by the Japan Aerospace Exploration Agency (JAXA). The space segment of QZSS consists of three satellites placed in periodic Highly Elliptical Orbits (HEO) covering the East Asia and Oceania region. QZSS is designed to work in conjunction with, and enhance, the civil services of GPS by transmitting four GPS-like signals (L1-C/A, L1C, L2C, L5) and two proprietary signals (L1-SAIF and LEX) to enhance the positioning performance down to the centimeter level.

In particular the L-Band experiment (LEX) signal was designed to use advanced digital communication techniques to establish the next generation's positioning based technology. These include the usage of the code-shift-keying (CSK) modulation, which increases the data rate of up to 40 times compared to the GPS L1 C/A code, and the usage of Reed-Solomon Codes that improve the data robustness in difficult environments, as those typical of big urban cities.

The proposed Master Thesis consists of the investigation of the QZSS LEX signal and message structures and associated techniques. This will be followed by the implementation of processing algorithms enabling IFEN's GNSS software receiver to support this new type of signal.

Furthermore, the high flexibility of the software receiver will allow extending the developed algorithms to more generic CSK signal schemes. The thesis work will finally include testing and experimentations with live signals to verify the correctness of the approach and to obtain some preliminary feedback on the performance of the LEX signal.

The thesis is carried out in the IFEN premises either in Poing/Germany or in Graz/Austria. It is within the context of the Galileo Evolution program of the European Space Agency.

Requirements

- Master student in Aerospace Engineering, Navigation, Communications Engineering or equivalent sciences
- Programming skills in (C/C++) and willingness to enhance them during the thesis
- Good written and spoken English
- Ability to grasp and learn new concepts quickly and efficiently
- Capacity to approach challenges with a positive attitude and open mind

Application

Please send your resume via Email to **careers@ifen.com**

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