



3D AEROSPACE

3D/2020/INT/006 Internship Opportunity

Development and implementation of a Real Time dual frequency PVT engine in a SDR



Company

3D Aerospace (www.3daerospace.eu) is an European young start-up established in June 2018. 3D Aerospace is located at Albi (France) in the incubator of the Ecole des Mines. 3D Aerospace has received several funding (local, national and European) in order to manufacture and test its first prototypes by Summer 2020. The company is developing an innovative new generation of GNSS (GPS / Galileo) receiver targeting Industry V4.0 applications.

The company is based on equality gender, positive working atmosphere, hard work transparent communication and continuous improvement. 3D Aerospace proposes a safe environment to make innovation happens. As a high technology company, failure is perceived as an opportunity to learn and improve and is accepted as long as a rigorous and structured work is applied.



Internship

During the period of the internship, the intern will have the opportunity and responsibility to work on three main topics:

1. GNSS requirements of the receiver

3D Aerospace platform is made of an accurate GPS receiver (submetric accuracy) and an array of cameras working in visible and infrared wavelengths. The GNSS antenna is capable of capturing the three Galileo frequencies (E5, E6 and E1) as well as L1 and L5 GPS signals. During this first part of the internship, the intern will have to:

- Review the GNSS subsystem requirements based on the system requirements.



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- Be familiar with the existing work performed in the development of the PVT engine.
- Perform a literature on the GNSS signal structures (carrier, subcarrier, navigation message), GNSS SDR, PVT (mono-frequency and dual frequency).

2. Development of a real time dual-frequency PVT engine in static environment

The purposes of this second task are:

- To develop a PVT model using Simulink capable of processing Galileo (E5, E1 first and then E6) and GPS signals (L1 and L5).
- To enhance this model by using an URSP equipment for real-time implementation.

3. Development of a real time dual-frequency PVT engine in dynamic environment

The intern will be involved in the development and implementation of the developed PVT engine considering a dynamic environment. Additional features such as enhanced acquisition and tracking loops, PRN acquisition and tracking strategy, memory allocation, coupling with additional sensors (IMU and/or cameras) could also be envisaged depending on the progress of the intern.

4. Support to the embedded software team

Finally, the intern will support the embedded software team in implementing the developed algorithm (the PVT engine) into 3D Aerospace SDR (FPGA). The intern will have the opportunity to take part of test campaigns.



Additional Information

Location: 20 Chemin de la Teuliere, Albi, 81000 France

Internship Duration : 6 months starting from February / March to End of August 2020.

Working Language: English

Internship allowance: 575.50€ per calendar month



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Contact email address: contact@3daerospace.eu

Working conditions: 3D Aerospace is a small team of passionate and hard worker people. Our small size is actually one of our main strengths as it provides agility, flexibility and a sense of family-size company. Our organisation is based on daily scrums and monthly milestones review.

Application process: One case study to prepare offline and an one to one interview with 3D Aerospace core team.

Hardware: 3D Aerospace have GNSS play and record device which will be used during the frame of this internship.