

18/26 - Aircraft 3D real-time tracing and colliding detection with map elevation

Company Description

The Satellite Applications Catapult is a not-for-profit company and one of a network of centres established by Innovate UK to accelerate the take up of emerging technologies. The Catapult is transforming the way the world uses satellite technology, enabling new business and improving people's lives. We are accelerating the growth of the UK space sector by: raising awareness and increasing demand for satellite-enabled services; making space technology more accessible and relevant; and helping businesses, entrepreneurs and innovators to overcome challenges and bring new products and services to market.

Working around the globe, the Catapult is bringing together multi-disciplinary and technical entities from government, industry and academic to deliver new innovative ideas and solutions for a variety of markets including agriculture, mining, transport, government services and maritime

Project Description

To develop a Windows based software system to trace aircraft in real-time, with collision detection and map elevation. The system can be used to monitor aeroplanes with ADS-B data, or to monitor drone with wireless data, alongside colliding detection and object recognition and avoidance (machine learning) with the given 3D map API.

The system will be developed with the Unity game engine using C# programming language and 3D map API (WRLD or Bing map API).

The functionality of the system will be to

1. Navigate on a 3D map
2. Zoom in/out view
3. 3D object tracing based on the location data in plain format file(s)
4. Real-time collision detection
5. Warning mechanism with the given colliding threshold

Note that for each of the suggested functions, the sample code and algorithms will be provided, but there will be some changes required in the code.

There will be the opportunity during this project to gain the following skills:

1. Satellite data processing
2. C# programming
3. Game programming
4. Map navigation
5. Multi-threading programming
6. GPU programming
7. Source code control system (git, github etc)
8. The complete cycle of the software development including plan, design, coding, debug and test.

Applicant Specification

Basic programming skills, ideally C#, previous experience of using any third-party API, basic knowledge of the map navigation, understanding of math co-ordinate transform, rotation etc.

We are looking for an applicant who is enthusiastic, self-motivated, hard-working, and have strong interests in computer programming and space application development.

Further Details

The system is intended to be open-sourced, and so the coding work will be reviewed in each stage of the development. The successful applicants are expected to write quality code with detailed code comments.

Closing Date

Wednesday 16 May

Interviews

Week commencing 21 May

The Nitty Gritty

8 weeks fixed term contract to be agreed with successful candidate but nominally with a start date around 18 June which is also the SPIN Induction day at Harwell. Salary is £1,500 per calendar month.

Apply

To apply please head back to the SPIN page on the Catapult website:

<https://sa.catapult.org.uk/people/space-placements-industry-spin/>