

FMCW Doppler Radar Profiler Data Post Processing

Code: 20/22

Company: S&AO Ltd

Location: Working from home and on Harwell Campus (if possible again at time of placement)

Company Description:

S&AO Ltd is the innovation company re-writing the atmospheric observations sector with new solutions. Under the brand name visionAIR-Klugmann it offers solutions that deal with known shortcomings and capability gaps of existing remote sensing systems. These solutions provide users with the information they need at costs they can afford and allow new kinds of observations and applications.

S&AO Ltd is the observation systems developer that combines scientifically established methods with latest components into sensor technique – brand name visionAIR-Klugmann – providing affordable and reliable operational measurements. This enables organisations using meteorological data to optimise their operations, save money and prevent the loss of lives.

Branded visionAIR-Klugmann observation systems can be applied for providing ground truth, verification and calibration of satellite-based weather observations. The long-term goal is the fusion of data from visionAIR-Klugmann observation systems with satellite-based weather observations to enable better weather forecasts and more accurate and timely hazard warnings.

Project Description:

1. Learn the specifics of FMCW Doppler Radar data processing, specifically how range and Doppler velocity are extracted from observed spectra. (Advice on literature will be provided.)
2. Develop program code (in a high-level computing language: Python, Octave, or variations of C and FORTRAN) for creating velocity-intensity diagrams by range, and displaying these appropriately. This provides Level 1 data.
3. Learn about the physics background of scattering of electro-magnetic radiation at Hydrometeors, as well as about the relationship between terminal fall velocity of Hydrometeors with drop(let) size. (Advice on literature will be provided.)
4. Develop program code (in a high-level computing language) for creating profiles of the drop(let) size distribution and profiles of information derived from these (e.g. Liquid Water Content), and displaying these appropriately. This provides Level 2 data.

Applicant Specification:

Applicant Specification: Bachelors' student past Year 2, or Masters' student.

Minimum Requirements:

- Academic background: Physics, Mathematics, or Engineering with strong Maths background.
- Knowledge of, and some experience with at least one high-level computing language (Python, Octave, or variations of C and FORTRAN).

Preferred Additional Requirements:

- Experience with processing remote sensing data, specifically ranging systems (Radar, Lidar)
- Experience with AWS (Amazon Web Services).

Further details:

8 weeks minimum fixed term contract to be agreed with successful candidate but nominally with a start date around 15 June 2020 to attend the SPIN Induction day at the Satellite Applications Catapult, and completion before Late September for the Showcase. Salary is £1,200 per calendar month gross for 30 working hours per week. A break of up to three weeks during the project, extending the total project duration accordingly, can be agreed.

Closing Date for Applications: 5pm Friday 17 April

Applications should be made through the online form attaching a CV, before the closing date. Please note that elements of the form left incomplete will be deemed to render the application ineligible. They will be checked for eligibility and forwarded to the employer.