Satellite-based solutions to solve microclimate weather forecasting

Code: 21/36

Company: Weather Logistics Ltd

Location: Nottingham, UK (*Virtual/ Remote Working*)

Company Description:

Weather Logistics is a climate-tech company delivering seasonal forecast solutions (currently for the agricultural sector). We develop solutions for grower cooperatives, producer organisations and decision-support organisations to improve the sustainability of fresh produce. Our goal is to reduce input costs and the carbon footprint of food production, building adaption and resilience of the agri-food industry to extreme weather and seasonal climate variability on monthly timescales.

We work with industry partners, academia, and software engineering teams. Ongoing projects include a partner on a £0.65m NERC funded project as an end-user of seasonal forecasts, supporting sustainable sugar beet production in Turkey, and a data sponsor for Yield21 to predict winter wheat yields. We have also supplied weather services to one of Europe's largest salad producers.

Project Description:

Data-driven solutions to solve microclimate challenges (especially field to field exposure to frosts, rainfall extremes, hail risk, and/ or wind gusts) would have a large and potentially game-changing impact for the agricultural sector. We think that high-resolution satellite data could help tackle this challenge. The market opportunity would extend to agricultural firms to replace IoT sensor networks, utility companies (renewables), climate risk management, (re)insurance and parametric flood insurance.

Existing approaches are not sufficiently detailed, and may rely on expensive instrumentation e.g., rainfall sensors to detect flood levels or night-time frosts in top-fruit orchards). These ground sensors provide an incomplete spatial representation of local conditions. Furthermore, existing providers cannot reliably detect extreme daily (or hourly) weather conditions on fine local scales.

With many decision-support companies now operating in the financial risk posed by climate and extreme weather, the data is now available from space to build a reliable 'digital twin' of weather on hundred-of-metre scales for a variety of cross-sector applications. We are therefore looking for a software engineering solution to combine metre-resolution satellite data with our pre-existing seasonal weather data (daily outlooks on a scale of several kilometres), to represent features that would otherwise be only be estimated through computer intensive land-surface models. Competing public services under

development over the next 5 years will cost 8bn Euro in supercomputing investments, whereas we are confident that a data-driven solution can deliver a low-cost alternative.

The project would initially be supported through discussions with a top-fruit producer we have previously worked with. The benefit of working with this stakeholder is two-fold: a) they are actively looking to transition to a satellite-based solution, and b) can provide access to local IoT weather sensor data for ground-truth testing of the project outputs.

Applicant Specification:

We are looking for a candidate who likes problem solving, and who can manage complexity to develop lean and quick solutions in a logical process. Communicating with end-users to match their requirements and design (and eliminate) technology features is essential. The goal of this internship is not to develop a full solution, but to demonstrate a pilot of a working solution (small-scale test) that can then be scaled up into an operational solution at a later development stage. The successful intern will be able to communicate that they can use satellite data to solve the microclimate challenge, potentially convincing the prospective client to commit to further work. Further funding opportunities may then be available to continue their work to develop the full commercial solution for the client(s), or to extend this value offering to other industrial environments e.g., risk finance/ (re)insurance.

Minimum Requirements:

- Degree in science, engineering, or equivalent qualification
- Experience with software development/ programming languages (Python, R etc.)
- Comfortable working remotely
- Able to deal with ambiguity and complexity
- An excellent communicator

Preferred Additional Requirements:

- Industrial software engineering experience
- Satellite data expertise
- Industrial experience within the space and/ or agri-food, (re)insurance or fintech sectors

Further details:

The start date is provisionally 21 June 2021 with applications open until the end of May 2021. Please note that the candidate will be expected to work remotely and must be comfortable working independently for long durations of the project; communicating through video conferencing, telephone meeting and post-covid channels (e.g., collaborative software development portals). This situation may change as the project progresses.

8 weeks minimum fixed term contract to be agreed with successful candidate. Virtual Induction Event to be held on 21 June 2021. Ideally to complete before the start of the next academic year. Salary is £1,500 per calendar month gross pay.

Closing Date for Applications: 5pm Friday 28 May 2021

Applications should be made through the online form on the Satellite Applications Catapult website before the closing date.

https://sa.catapult.org.uk/work-with-us/space-placements-industry-spin/

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. Email applications made to the Satellite Applications Catapult, UK Space Agency, or host organisations will not be processed.