Job Description - Machine Learning and Citizen Science
Post-doctoral Research Associate

About the Role

The role is a postdoctoral research associate (PDRA) in astronomy/physics to develop crowdsourcing experiments (citizen science) that can be used in collaboration with machine learning and deep learning. The role is based in the School of Physical Sciences at the Open University (OU). The research fellowship is to facilitate the design of new crowdsourcing experiments for major international astronomy, astroparticle physics and physics facilities, and act as project manager for these experiments. The crowdsourced classifications will be fed into machine learning algorithms developed by the PDRA, which will then accelerate the classifications and allow the volunteers to focus effort on more difficult edge cases.

The appointee will liaise with crowdsourcing contacts in the major European facilities and their precursors and pathfinders, such as the Square Kilometre Array, the European Southern Observatory including the Extremely Large Telescope, the Cherenkov Telescope Array, the KM3NeT neutrino telescope, the FAIR accelerator, CERN including the High Luminosity Large Hadron Collider, the European Gravitational Observatory, the European Solar Telescope, the Large Synoptic Survey Telescope.

The project is funded through the Horizon 2020 project ESCAPE (European Science Cluster of Astronomy and Particle physics ESFRI research infrastructures), and appointee with also liaise with other members of the ESCAPE consortium.

Key responsibilities

- To facilitate the creation of new crowdsourcing experiments that support the major astronomy and astroparticle physics experiments (e.g. Vera Rubin LSST, E-ELT, SKA, CTA, FAIR, CERN, HL-LHC, EGO, EST, and/or KM3NeT, and their precursors/pathfinders), e.g. through organising international workshops.
- To adapt and/or produce simulated data for testing these citizen science experiments.
- To manage the operation of these mass participation experiments and drive their science analysis.
- To design machine learning algorithms to accelerate the volunteer classifications.
- To design and/or facilitate the creation of associated text and video educational and public engagement materials for the citizen science experiments.
- To create software tools for the management of citizen science data in the ESCAPE Science Analysis Platform.
Skills and experience

Essential:

- PhD (or equivalent) in astronomy or physics, or a closely related area.
- Research experience in an area relevant to an ESFRI facility (e.g. relevant to LSST, E-ELT, SKA, CTA, FAIR, CERN, HL-LHC, EGO, EST, and/or KM3NeT, and their precursors/pathfinders).
- Willingness to travel as required by the role, which may require flexibility in the hours worked.
- Ability to plan and organise.
- Problem solving and decision making skills.
- Ability to work independently with minimal supervision.
- Ability to work in a team environment, including geographically dispersed teams.

Desirable:

- Research track record in large experiments, such as citizen science experiments
- Experience in the development of machine learning algorithms
- Research interests cognate with staff in the School of Physical Sciences, e.g. in extragalactic astronomy, LSST, E-ELT, SKA.