|  |  |
| --- | --- |
| **Job Title:** | Research Fellow A |

|  |  |
| --- | --- |
| **Responsible to:** | Head of research group, or principal investigator |

|  |  |
| --- | --- |
| **Responsible for:** | Not applicable |

|  |
| --- |
| Job Summary and Purpose: |
| To undertake research in accordance with the specified research project(s) under the supervision of the principal investigator. |

|  |
| --- |
| Main Responsibilities/Activities |
| To undertake a range of research activities within a specified research area, assuming responsibility for specific areas of projects and making use of new research techniques and methods, in consultation with the research award holder or supervisor. This may include fieldwork, interviews, laboratory experimentation, critical evaluation and interpretation, computer-based data analysis and evaluation or library research.  Using initiative and creativity to identify areas for research develop new research methods and extend the research portfolio. Analysing and interpreting results of own research. Write up results and prepare papers for submission to appropriate journals and conferences, and other outputs as required and/or appropriate. Attend appropriate conferences for the purpose of disseminating research results of personal development. The post holder may also contribute to writing bids for research grants and will contribute to collaborative decision making with colleagues in areas of research.  Continually to update knowledge and develop skills, and translate knowledge of advances in the area into research activity.  To plan and manage own research activity in collaboration with others. To carry out administrative tasks associated with specified research funding, for example risk assessment of research activities, organisation of project meetings and documentation. Implementation of procedures required to ensure accurate and timely formal reporting and financial control.  To contribute to teaching in the Faculty by carrying out student supervision and/or demonstrating within the post holder’s area of expertise and under the direct guidance of a member of departmental academic staff, as appropriate.  The post holder may occasionally be required to supervise more junior research staff. |

|  |
| --- |
| **Person Specification** |
| The post holder must have:A doctoral degree in a relevant discipline (although individuals who have almost completed a doctoral degree may be appointed). Consideration may also be given to individuals who do not hold a doctoral degree but have required skills based on a number of years experience in specified / relevant fields The post holder will have authority over some aspects of project work and must be capable of providing academic judgement, offering original and creative thoughts and be able to interpret and analyse results. |

|  |
| --- |
| **Relationships and Contacts** |
| Direct responsibility to the principal investigator or academic supervisor. The post holder may be asked to serve on a relevant Faculty committee. There may be additional reporting and liaison responsibilities to external funding bodies or sponsors. The post holder may work on original research tasks with colleagues in other institutions. |

|  |
| --- |
| **Special Requirements** |
| To be available to participate in fieldwork as required by the specified research project |

### All staff are expected to:

* Positively support equality of opportunity and equity of treatment to colleagues and students in accordance with the University of Surrey Equal Opportunities policy.
* Help maintain a safe working environment by:
* Attending training in Health and Safety requirements as necessary, both on appointment and as changes in duties and techniques demand
* Following local codes of safe working practices and the University of Surrey Health and Safety Policy
* Undertake such other duties within the scope of the post as may be requested by your Manager.

Addendum to Role Profile

|  |  |
| --- | --- |
| **Job Title:** | Research Fellow in Audio Signal Processing and Machine Learning |

|  |
| --- |
| Job Summary and Purpose: |
| This information sheet should be read in conjunction with the accompanying generic Research RA1A Role Profile and will be used for shortlisting processes. More specifically the post holder will be expected to:   1. Investigate and develop signal processing and machine learning methods for audio source detection and localization, e.g. for drone sound; 2. Investigate a range of methods for this purpose, such as machine learning, feature extraction, beamforming, direction of arrival estimation, and detection, localization and classification of drone sound signals; 3. Autonomously undertake the design, development and implementation of novel algorithms for audio source localization and detection; 4. Collect drone sound recordings using microphone or microphone arrays, using real drones. Cloud source drone sounds and environmental sound data. Use data augmentation techniques for expand drone sound and background sound. 5. Develop software tools demonstrating the capability of advanced signal processing and machine learning (such as deep learning) for audio source localization and recognition. 6. Meet on a weekly basis with project staff including collaborators at Airspeed, and attend project meetings and present results at other sites as required, including the project partner Airspeed; 7. Publish and present research in high-quality international journals and conferences. 8. Pro-actively organise and manage own time and research-related activities. 9. Report orally and prepare papers reporting progress and delivery of project outcomes, and be able to communicate at both technical and high-level for example with the project partner. 10. Perform any other duties associated with the project, as deemed appropriate to the grade by the Principal Investigator. 11. Promote the research and activities of the project and the Centre for Vision, Speech and Signal Processing (CVSSP) in national and international forums. |

|  |
| --- |
| Main Responsibilities/Activities |
| Research in advanced signal processing and machine learning methods for sound detection and localization  Meet on a weekly basis on campus with CVSSP staff, or virtually during the Covid-19 lockdown, via online meeting tools, such as Zoom, Skype, or other suitable tools  Attend project meetings and present results at other sites as required  Give oral and written reports on project progress and outcomes. Be able to report at both a technical low-level and conceptual high-level to a range of audiences including the public and industry  Continually update knowledge and develop skills  Carry out routine administrative tasks associated with a specified research project, for example risk assessment of research tasks, organisation of project meetings and documentation. This will entail planning own day-to-day research activity within the framework of the agreed programme, dealing with problems that may affect the achievement of research objectives (such as Covid-19 lockdown) and deadlines and implementing procedures required to ensure accurate and timely delivery. |

|  |
| --- |
| **Person Specification** |
| The post holder must have: Doctoral level research experience (or equivalent) in electronic engineering, computer science or a related subject;  Significant research experience in audio signal processing and machine learning  Skills and experience in developing new research algorithms or methods, using languages such as Python, C++ and/or MATLAB, with relevant signal processing and/or machine learning tools  Ability to work independently, with strong organisational and time management skills  **The post holder would ideally have:**  Research experience in one or more of the following is desirable: audio signal processing; machine learning;  Strong writing skills across different levels of technical audience are desirable  A track record of academic publications in a relevant area is desirable |

|  |
| --- |
| **Relationships and Contacts** |
| Direct responsibility to Principal Investigator Prof Wenwu Wang. |

|  |
| --- |
| Additional Background Information |
| This post is funded by MoD Defence and Security Acceleration (DASA) Programme Phase 2 scheme “Countering Drones”. The project will be led by Prof Wenwu Wang in the Machine Audition Lab of the Centre for Vision Speech and Signal Processing (CVSSP) at the University of Surrey. This is a joint project with Airspeed, aiming to develop AI methods for detecting drone sound using acoustic sensors.  In this project, we will develop methods to detect sound from flying drones. The project will focus on developing signal processing and machine learning algorithms to detect and localize, and recognize drone sounds. To train a machine learning model, we will also need to collect some data from real drones, cloud source drone sound and environmental sound, and expand the drone sound dataset with state-of-the-art data augmentation techniques.  The postholder will be responsible for investigating and developing signal processing and machine learning methods for detecting, localizing and recognizing sound sources from drones, collecting and augmenting the drone dataset. The postholder will be based in CVSSP and work under the direction of PI Prof Wang, in collaboration with Airspeed.  CVSSP is one of the largest groups of its type in the UK, with over 180 active researchers working in the areas of vision, image processing, medical imaging, and audio, and a grant portfolio of over £20M. The Centre has state-of-the-art acoustic capture and analysis facilities enabling research into audio signal processing, music transcription and spatial audio, and a Visual Media Lab with video and audio capture facilities supporting research in real-time video and audio processing and visualisation. It has an extensive computing infrastructure for audio-visual processing and storage, comprised over 1,000 processing cores and a recent university investment of 600TB of fast, object based storage. |