

Research Role Profile

Job Title:	Research Fellow A
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Responsible to:	Head of research group, or principal investigator
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Responsible for:	Not applicable
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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.

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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.

Research Role Profile

Addendum to Role Profile

Job Title:	Research Fellow in Generative Audio AI
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Job Summary and Purpose:
<u>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:</u> (i) Investigate and develop generative AI, machine learning and signal processing methods for audio generation, including audio generation for environmental sounds; (ii) Investigate a range of methods for this purpose, including text to audio generation, video to audio generation, and audio-related multimodal content generation using approaches such as diffusion models and/or flow matching; (iii) Autonomously undertake the design, development, implementation and improvement of the generative AI models for audio generation, including considerations such as efficiency, controllability and long-sequence generation. (iv) Meet on a weekly basis with project staff, and attend project meetings and present results at other sites as required, including other partners involved in the AI Hub in Generative Models; (v) Publish and present research in high-quality international journals and conferences. (vi) Pro-actively organise and manage own time and research-related activities. (vii) 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 project research partners. (viii) Perform any other duties associated with the project, as deemed appropriate to the grade by the Principal Investigator. (ix) 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
Undertake research in generative AI and machine learning methods for audio generation and audio-related multimodal content generation. Perform experimental studies of the generative AI models, including in collaboration with project partners. Meet on a weekly basis on campus with Principal Investigator, or occasionally via online meeting tools, such as Zoom, Skype, or other suitable tools. Attend project meetings and present results at other sites as required

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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 and deadlines and implementing procedures required to ensure accurate and timely delivery.

Person Specification

The post holder must have:

Doctoral level research experience in electronic engineering, computer science, applied mathematics, statistics, artificial intelligence, audio engineering, or a related subject.

Significant research experience in audio signal processing, audio-related multimodal processing (audio with text and/or video), audio deep learning, or a related topic.

Skills and experience in developing new research algorithms or methods, using languages such as Python, C++ and/or MATLAB, with relevant signal processing, machine learning and/or deep learning tools (TensorFlow, PyTorch, Keras, etc.)

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: diffusion and/or flow matching models, audio generation, audio-language models, text-to-audio generation, video-to-audio generation, or related cross-modal generation and learning tasks.

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 Mark Plumbley

Informal enquiries are welcome and should be directed to Prof Mark Plumbley,
m.plumbley@surrey.ac.uk

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Additional Background Information

This post is part of the AI Hub in Generative Models (Gen AI Hub, <https://www.genai.ac.uk/>), one of nine AI research hubs located across the UK. The hubs, which are funded by the UK Engineering and Physical Science Research Council (EPSRC), will explore how AI can be developed for a wide range of applications.

The Gen AI Hub is a collaboration between the University of Surrey, University College London, Imperial College London, and the Universities of Cambridge, Cardiff, Edinburgh, Manchester, and Oxford. The Gen AI Hub brings together experts in Generative AI, from industry and academia, to collaborate on impactful projects and enterprises in a way no single organisation could on its own. Its aim is to make Generative AI models more customisable, reliable and trustworthy, and to help to realise the benefits of these technologies for society, science and the economy.

At the University of Surrey, our focus will be on Generative Audio AI, as part of a working group on Multimodal Models.

Models such as DiffSound, AudioGen and our own AudioLDM can revolutionize creative sound generation. However, artists and music organizations have significant concerns about AI generated music. We will work with audio researchers, government and the music industry to benefit content creators and support the audio creative industry. We plan to develop methods to generate audio from seconds to days; investigate low cost audio generation; generate high quality audio, assessed through human listening tests; generate audio for radio dramas, film, video and games; and generate audio from text for accessibility.

The postholder will be responsible for undertaking research in generative AI and machine learning methods for audio generation, including in particular audio generation for environmental sounds, and performing experimental studies of the generative AI models, including in collaboration with project partners.

The postholder will be based in the Centre for Vision Speech and Signal Processing (CVSSP) and the Surrey Institute for People-Centred AI, and work under the direction of Prof Mark Plumbley.

CVSSP is an International Centre of Excellence for research in Audio-Visual Machine Perception and AI, with over 180 researchers. The Centre has state-of-the-art audio and video capture and analysis facilities supporting research in real-time video and audio processing and visualisation. CVSSP has a compute facility with 200 GPUs and >2PB of high-speed secure storage.

The Surrey Institute for People-Centred AI is the founding pan-university institute at the University of Surrey, bringing together core AI-related expertise in audio-visual and signal processing, computer science, and mathematics, with its domain expertise across engineering and physical sciences, human and animal health, law and regulation, business, finance and the arts and social sciences. Our multi-disciplinary approach puts people at the heart of AI. Our research starts with the problems that impact individuals, communities and society, and identifies how AI can address these challenges safely, responsibly and inclusively.

Research Role Profile

The University of Surrey is a global university with a world-class research profile and an enterprising spirit, located in one of the safest counties in England, within 35 minutes of London by train and minutes away from the Surrey Hills, an Area of Outstanding Natural Beauty. Recent investments have seen the opening of a world-class Sports Park and important updates to central facilities.

Project Summary: AI Hub in Generative Models

Generative Models are AI models that can generate data. Recently researchers have shown that by training these models on large amounts of data (text data from the internet and images) these models learn to understand the regularities of our text and image world so well that they can generate responses to questions and create new images with surprising fidelity. This heralds a new era in which computers can assist humans to carry out tasks more efficiently than ever with significant opportunities for society, science and industry. However, these advances need significant research still - how to make them train efficiently on different problems, how to understand their reliability and adherence to ethical norms.

Website: <https://www.genai.ac.uk/>