



Postdoctoral Research Associate

Grade and salary: Grade 7, £39,906 – £46,049 per annum

Working hours: Full time

Tenure: The post is available up to 31 May 2030

Location: Liverpool campus

Faculty: Faculty of Science and Engineering, School of Computer Science & Informatics

Recruiting department contact: Dr. Konstantinos Tsakalidis, email:
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Job ref: 117713

The Role

Role overview and University context:

AIM-SAFE is a Horizon Europe project (Grant Agreement No. 101287214) building a multi-agent clinical reasoning framework from open-weight, locally deployable AI, in partnership with KAIST, Knowledgator, the Royal Marsden NHS Foundation Trust and CERN. The University of Liverpool leads Task 5.1 of Work Package 5: selecting, fine-tuning and optimising the Small Language Models (SLMs) that power every clinical reasoning agent in the system. This post takes day-to-day technical ownership of Task 5.1 and is based in the [School of Computer Science and Informatics](#), Faculty of Science and Engineering, with access to University HPC facilities and the CAFEIN federated-learning infrastructure at CERN.

Key responsibilities:

- Lead the day-to-day technical delivery of AIM-SAFE Task 5.1 (SLM selection, fine-tuning and optimisation) within Work Package 5.
- Benchmark open-weight SLMs (up to ~7B parameters) on clinical NLP tasks such as entity recognition, symptom extraction, drug-interaction reasoning and medication reconciliation, and select the base model for each agent role.
- Design and run parameter-efficient fine-tuning pipelines (LoRA, QLoRA, adapters) within a reproducible MLOps framework covering experiment tracking, versioning and evaluation reporting.
- Apply quantisation strategies (GPTQ, AWQ, GGUF/llama.cpp) to produce models suitable for CPU-feasible local deployment in resource-constrained NHS and clinical settings.
- Integrate federated and privacy-preserving learning (e.g. FedProx, SCAFFOLD aggregation) via the CAFEIN platform at CERN, ensuring no raw patient data leaves institutional boundaries.
- Embed the RUC2 (Royal Marsden Unsafe Content Categorisation) safety governance layer into model evaluation, so that outputs meet clinical safety thresholds before agent integration.
- Maintain documentation of data provenance, model cards and bias assessments in line with GDPR and EU AI Act obligations for high-risk AI systems in healthcare.
- Act as technical liaison with the KAIST-led multi-agent orchestration team (Task 5.2), defining typed Python/API contracts that expose each fine-tuned SLM as an agent endpoint and supplying benchmarking and capability profiles.
- Work with the Knowledgator-led RAG team (Task 5.3) to integrate and evaluate retrieval-augmented generation pipelines, testing faithfulness, citation grounding and hallucination rates.
- Lead the production of Deliverable D5.1 (Report on fine-tuned LLMs and core agent architecture, due Month 24), coordinating contributions from partner institutions.
- Publish in high-impact venues, contribute to open-source releases, and represent the University at consortium meetings and EU project reviews.
- Mentor junior researchers and assist in the supervision of PhD students associated with Work Package 5.

In addition to the above, all University of Liverpool staff are required to:

- Adhere to all University policies and procedures, completing all obligatory training and induction modules, including Equality & Diversity and Health & Safety.
- Support the University's vision to drive forward environmental and social equity through delivery of our [Sustainability Strategy](#) and associated action plans.
- Demonstrate customer service excellence and continuous improvement in engaging with all stakeholders.
- Respect confidentiality: all confidential information should be kept in confidence and not released to unauthorised persons.
- Participate in the University's Professional Development Review scheme and take a proactive approach to own professional development.
- Embody and uphold the University's Vision and Values.
- Demonstrate flexibility in on-campus-presence to enable participation in business-critical activities, including reasonable participation in such things as: open days, invigilation, welcome week activities, confirmation and clearing and financial year-end activities.

About you

Experience

Essential

1. A strong publication record, commensurate with career stage, in NLP, machine learning or clinical AI.
2. Hands-on experience of parameter-efficient fine-tuning of language models (LoRA, QLoRA, prefix tuning, adapter modules) using HuggingFace PEFT, Transformers and Datasets.
3. Experience of MLOps practice, including experiment tracking (e.g. MLflow, Weights & Biases), model registries, evaluation pipelines and reproducible workflows.
4. Experience of working in multi-institutional, internationally distributed research projects.

Desirable

1. Experience with federated learning frameworks (e.g. Flower, PySyft, OpenFL) and differential privacy techniques.
2. Experience with containerisation and HPC environments (Docker, Singularity, SLURM) relevant to federated deployment on the CAFEIN/CERN infrastructure.
3. Prior work on AI safety, output filtering or content moderation in high-stakes application domains.
4. Experience of deploying AI tools in NHS or other healthcare settings, or an existing network of clinical collaborators.

Education, qualifications and training

Essential

1. PhD (awarded or submitted) in Computer Science, Machine Learning, Computational Linguistics, Biomedical Informatics or a closely related discipline.

Skills, general and specialist knowledge

Essential

1. Deep expertise in transformer-based language model architectures (encoder-only, decoder-only and encoder-decoder), including pre-training objectives and attention mechanisms.
2. Proficiency in model quantisation techniques (GPTQ, AWQ, bitsandbytes, GGUF/llama.cpp) for deployment on memory-constrained hardware.
3. Strong Python and PyTorch skills, with the ability to write clean, tested, version-controlled research code (Git, CI/CD pipelines).
4. Working knowledge of NLP evaluation methods (BLEU, ROUGE, BERTScore, exact match) and clinical-domain benchmarks (e.g. MedQA, MedMCQA, i2b2).
5. Ability to design and document typed API or interface contracts for use by other engineering teams.
6. Awareness of GDPR data-handling obligations and EU AI Act risk classification requirements for healthcare AI, sufficient to guide data governance decisions.

Desirable

1. Knowledge of Retrieval-Augmented Generation architectures (e.g. LangChain, LlamaIndex, FAISS, Weaviate) and experience of measuring RAG faithfulness or hallucination rates.
2. Familiarity with multi-agent frameworks such as Microsoft AutoGen, CrewAI or similar orchestration libraries.
3. Familiarity with clinical NLP corpora and annotation standards (MIMIC-III/IV, i2b2, SNOMED CT, ICD coding).

Personal attributes

Essential

1. Clear written and oral communication skills in English, including the ability to write technical reports and research papers to publication standard.
2. Comfortable working across institutional and international boundaries and acting as technical liaison between partner teams.

About us

Established in 1881, we are an internationally renowned Russell Group university recognised for our high-quality teaching and research. We are consistently ranked as one of the best universities both nationally and globally, and the majority of our research is rated world leading or internationally excellent. [Find out more about us.](#)

Why Work Here

We recognise, appreciate and celebrate the incredible work our staff do every day. As well as generous terms and conditions, we offer a range of enviable benefits and provide support for colleague's wellbeing and development. Discover more [about working here.](#)

Moving from abroad

As a global institute, we welcome applicants from all nationalities, moving from a different country can be challenging and we would like to help as much as we can, we have put together some information on eligibility to work documentation, accommodation, schools, healthcare, life in Liverpool and the UK as well as other practical information. Discover more about [moving from abroad.](#)

Our Staff

Whether it be their friendly colleagues, supportive managers or our outstanding facilities, our staff can explain better than anyone what it is like to work for us and why they enjoy their role. See what our [colleagues have to say.](#)

How to Apply

Application process

Our e-recruitment system enables you to register for an online account, where you can view, copy and edit your applications. Set up your account on our [Vacancies Portal.](#)

Please include a full CV (with a list of publications) and a covering letter of no more than two pages describing your suitability for the role and your motivation.

Once you submit your application you will receive an automatic email acknowledgment. You can view your application at any time by clicking into the application history section of your account.

The recruiting department will endeavour to respond to each application. However, if you have not heard within six weeks of the closing date, please take it that your application has not been successful on this occasion.

Job description

After the closing date this job description will be removed from our website. Should you wish to refer to this information at a later date please ensure you save a copy of this document.

Right to work

We have a legal responsibility to ensure that you have the right to work in the UK before you can start working for us. If you do not have the right to work in the UK already, any offer of employment will be conditional upon you gaining it. If the role is based outside the UK, you will need to demonstrate your right to work for the country in which you are to be based.

Disabilities and alternative formats

If you have any other requirements which will help you access the application or interview process or employment opportunities at the University, or if you require copies documentation in alternative formats, please email: jobs@liverpool.ac.uk or telephone 0151 794 6771.

