Candidate Information

Position:	Research Fellow, or Research Assistant
School/Department:	School Office (Elect, Elect Eng & Comp Sci)
Reference:	23/111245
Closing Date:	Monday 2 October 2023
Salary:	Research Assistant: £32,024 - £36,744 per annum. Research Fellow: £37,841 - £38,969 per annum
Anticipated Interview Date:	Tuesday 24 October 2023
Duration:	Fixed term until 31 August 2025

JOB PURPOSE:

To assist with or be a highly productive, ambitious and collaborative member of the UKRI-funded Real-time Process Modelling and Diagnostics: Powering Digital Factories (RAPID) research project/team assisting in the development of research proposals and the planning and delivery of the research activity. The project aims to develop a new digital modelling and analysis framework for real-time, in-situ processing of manufacturing data. The Researcher will undertake research into approaches and techniques for new transprecision computing approaches that will accelerate real-time data analytics computations using graphics processing units (GPUs) primarily for semiconductor and pharmaceutical applications.

As the project is a collaboration with the University of Edinburgh, Seagate, Glaxo Smith Kline and nVIDIA Research, a key aspect will be to collaborate closely with the project partners and demonstrate approaches using real examples. The post is a critical role, and as such, successful applicants will have responsibilities in independent research, supervision, planning, setting up hardware and software, collaborations, and outreach.

MAJOR DUTIES:

1. Undertake research under supervision within the specific research project and as a member of a research team into efficient high-performance computer implementation for manufacturing/pharmaceutical applications.
2. Design, develop and refine research using a range of experimental models. Create (Research Fellow) or develop with input from investigators (Research Assistant) new transprecision computing approaches for real-time data analytics computations that can be customised to the randomised sketching approach being developed by colleagues in the University of Edinburgh and that are suitable for high-performance computer implementation.
3. Generate (Research Fellow) or develop with input from investigators (Research Assistant) a common working framework that allows the implementation of efficient ‘edge-based’ Graphic Processing Unit (GPU) realisations targeted at edge-based environments in manufacturing.
4. Carry out analyses, critical evaluations, and interpretations of experimental data and the literature using methodologies and other techniques appropriate to area of research, for example, construct GPU-based exemplars for real-time process analytics, which will allow demonstration of the approach and performance evaluation and comparison to be undertaken against competitive, state-of-the-art approaches.
5. Produce high quality research outputs consistent with project aims and commensurate with career stage. This will include collaborating and co-authoring with PI and project team (as appropriate) on outputs.
6. Assist grant holder in the preparation of funding proposals and applications to external bodies.
7. Carry out occasional educational supervision, demonstrating or teaching duties within the post holder’s area of expertise and under the direct guidance of a member of academic staff.
8. Undertake supplementary duties relevant to the success of the project including administrative duties and additional training and development activities as required.

ESSENTIAL CRITERIA:

1. Research Assistant: Degree or higher qualification in computer science, electrical/electronic engineering, physics or related area.
   Research Fellow: Normally have or be about to obtain a PhD in the areas of computing hardware, programming, data analytics.
2. Research Assistant: Relevent research experience to include:
   • Undertaking research into computing hardware acceleration, GPU programming or data analytics.
   Research Fellow: Substantial relevant research experience to include:
   • Undertaking research into approaches to accelerate computing software solutions, optimisation techniques for improved computing, innovative data analytics for manufacturing.
   • Proven track record of undertaking analyses, critical evaluation and interpretations of experimental data as relevant to the research project.
   • Strong publication record commensurate with stage of career.
3. Ability to contribute to broader management and administrative processes.
4. Contribute to the School's outreach programme by links with industry, community groups etc.
5. Practical problem solving skills, independence of thought and initiative.
6. Ability to assess and organise resources.
7. Ability to communicate complex information in English effectively in oral and written format.
8. Ability to build relationships to develop internal and external networks.
9. Commitment to continuous professional development.

DESIRABLE CRITERIA:

1. Research experience in one or more of the following topics:
   • Computing acceleration approaches for data analytics;
   • Use of (multi/many-core) languages, with emphasis of programming in CUDA;
   • Parallel programming architectures, with emphasis in NVIDIA graphics processor units (GPUs);
   • Experience of practical hardware implementation for data analytics.
2. Participation in UKRI projects.
3. Skills in software development (operating system kernel modules, language runtime systems); skills in parallel (multi-/many-core) performance analysis and optimisation.