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**Job Description**

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| **Job title:** | Digital Applications Specialist, Innovation Centre for Applied Sustainable Technologies (iCAST) |
| **Department:** | Chemistry |
| **Grade:** | 7 |
| **Reporting to** | iCAST Executive Director & iCAST programme lead in Sustainable Manufacturing |
| **Responsible for** | No formal staff management responsibilities, although you will be expected to work closely with colleagues from the technical team in the Faculty of Science and the Dynamic Reaction Monitoring Facility as well as other iCAST colleagues at Bath and Oxford and their industrial project partners. |
| **Location:** | University of Bath premises, with occasional work at the iCAST Creative Hub in Swindon and potentially at industrial partner premises. Partial remote working from home possible as appropriate for the project. |

| **Job purpose** |
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| This is an exciting opportunity for a skilled and motivated researcher to become involved in developing the next generation of fully digitised and integrated process analytical technology platforms in close collaboration with a wide range of industrial stakeholders through a new knowledge exchange facility hosted by the Centre for Sustainable and Circular Technologies (CSCT) at Bath: the **Innovation Centre for Applied Sustainable Technologies (iCAST)**. This opportunity might suit a talented computer scientist with an interest in applying their work to sustainable chemical technologies, chemical scientists or engineers with experience in large data or software development, or anyone with skill and passion at the interface of analytical science and software engineering.  As a digital applications specialist in iCAST, you will be part of a vibrant team responsible for developing and delivering the underpinning research elements of the core innovation programme in Sustainable Manufacturing led by Dr Ulrich Hintermair. This includes hard- and software development for remote instrument control and data fusion of real-time process analytical technologies (PAT) applied to sustainable catalytic processes.  We have recently developed a world-leading Dynamic Reaction Monitoring (DReaM) Facility with have a proven track record in using a multi-technique approach for solving complex chemical problems. However, processing and analysing complimentary data from multiple analytical techniques remain challenging due to inherent differences in sensitivity, temporal resolution and data formats. New methods that enable automated data synchronisation and aligning in real time would allow to extract much more information quicker and with higher confidence, and open up possibilities for dynamic self-regulation, cyber-physical twinning, and seamless integration into smart factories for distributed manufacturing.  Specifically, the first layer concerns the collection of simple process data such as temperature, pressure, flow rate, stirring speed etc. over time and their effective regulation to defined setpoints. A second layer consists of collecting and stream-processing analytical data from UV-vis, IR, Raman and (Flow)NMR spectroscopies as well as sampling chromatography and mass spectrometry at different levels of abstraction. A third layer will seek to fuse all the data (process and analytical) to derive knowledge from the dynamic, multi-dimensional space using big data analysis tools and AI/ML algorithms.  The focus of this position will be on developing the underpinning capabilities on level 1 and 2 in preparation for level 3 to be implemented in the future. The work will be carried out in close interaction with the technical team of the Faculty of Science and IT Services at the University of Bath, and all methods developed will be refined and applied in Joint Industry Projects (JIPs) – short proof of principle and feasibility studies – in collaboration with suitable academic and industrial partners of iCAST.  Throughout the course of the project there will be opportunities to spend time in iCAST academic and industrial partners’ labs, and at the iCAST Creative Hub facility in Swindon. In addition to meeting the translational needs of iCAST programmes and projects, it is expected that there will be opportunities to publish research outputs in high impact journals.  Good technical and organisational skills are essential, as is the ability to work effectively in a dynamic and interdisciplinary environment. |

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| **Main duties and responsibilities** | |
| Responsible to iCAST Executive Director, relevant Core Programmes Leads and Joint Industry Projects (JIPs) Leads for: | |
| **1** | Designing, implementing and maintaining effective methods for remote instrument control relevant to chemical processing with secure data logging and archiving. This includes holistic analysis of needs, creative research of possible hard- and software solutions, and informed method selection with identification of possible limitations. |
| **2** | Contributing to the development and integration of new software solutions capable of multi-dimensional data fusion and analysis across a wide range of diverse types of unbounded data. |
| **3** | Engaging and working effectively with other specialists including hard- and software vendors as well as IT services and colleagues in Computer Science & Mathematics to deliver effective and sustainable solutions. |
| **4** | Contributing to the development of appropriate standard operating procedures and good practices in the generation, curation and management of scientific data. |
| **5** | Qualitative and quantitative analysis of existing data and continually updating knowledge and understanding in field or specialism to inform research activity. |
| **6** | Project management: timetabling and meeting project milestones; organising and participating in regular discussions with supervisors and collaborators; thorough and effective record-keeping. |
| **7** | Providing specialist and bespoke technical support to ongoing and future research projects in iCAST, the IfS and DReaM in relevant areas, including induction and training of staff and students. |
| **8** | Writing up results of research and contributing to publishing of results in high-quality peer-reviewed academic literature. |
| **9** | Participating regularly in meetings and delivering presentations to the iCAST team, internal and external stakeholders and funders. |

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| **Special conditions** |
| Compliance with all relevant Laws, Codes of Practice and regulations for the University and relevant discipline, in particular those pertaining to data standards and data management in science such as the [Data Together initiative](https://www.go-fair.org/wp-content/uploads/2020/03/Data-Together_March-2020.pdf). |

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| **Career and Professional Development Activities** |
| From time to time you may be asked to assist in the facilitation of CPD activities and participate in iCAST training and mentoring programmes for commercial skills (e.g. project and financial management, creative innovation and IP exploitation, etc.). You will also be expected to make your expertise available to the technical team of the Faculty of Science to help support other services and projects. These activities will form part of your role and you will not receive additional payment for them. |

**Person Specification**

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| **Criteria** | **Essential** | **Desirable** |
| **Experience/Knowledge** |  |  |
| Practical experience in data science, remote instrument control, process analytical technologies or related disciplines. | √ |  |
| Demonstrates significant depth and breadth of specialist knowledge of subject matter. | √ |  |
| Evidence of previous dissemination of research findings through high quality outputs (reports, patents, publications, etc). |  | √ |
| **Skills** |  |  |
| Experience in remote instrument control & regulation, data management, visualisation and coding. | √ |  |
| Ability to learn / adapt to new technologies. | √ |  |
| Basic knowledge and practical understanding of flow chemistry and chemical reaction engineering. |  | √ |
| Ability to select, implement and use appropriate analytical methods for reaction monitoring and process control. |  | √ |
| Demonstrable ability to effectively work across multiple projects at any one time with potentially conflicting or overlapping deadlines. | √ |  |
| Excellent oral, interpersonal and written communication skills. | √ |  |
| Ability to prepare research papers, to conduct individual research work, and to disseminate results to multidisciplinary audiences, including industrial stakeholders. |  | √ |
| **Attributes** |  |  |
| Innovation and developing creative solutions | √ |  |
| Enthusiasm and self-motivation | √ |  |
| Tenacity – working to achieve goals and overcoming obstacles | √ |  |
| Objective, critical thinking and independent literature analysis | √ |  |
| **Qualifications** |  |  |
| A PhD degree in chemistry, chemical engineering, data science or other relevant discipline or an equivalent professional qualification or industrial experience. |  | √ |