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**Job Description**

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| **Job title** | Research Associate |
| **Department/School** | Mechanical Engineering |
| **Job family** | Education and Research |
| **Grade** | 7 |
| **Reporting to** | Principal Investigator (PI) or Co-Investigator (CI) |
| **Responsible for** | There may be a requirement for:  day to day supervision of other staff e.g. technical staff or, co-supervision of doctoral or undergraduate students |
| **Location** | University of Bath premises |

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| **Background and context** |
| The RA will undertake research into the use of Frequency Scanning Interferometry  (FSI) in providing feedback signals for the control of high precision of robotenabled manufacture. The aims are to:  • Set up a dynamic model of the FSI system (OPTIMUM) supplied by the  National Physical Laboratory (NPL). The model will embed the distance  measuring capability of the FSI beams, measurement uncertainty and  latency of the signal transmission. The model will be validated against data  from NPL.  • Integrate the OPTIMUM system model with a robot system model. By  minimising uncertainty transmission, the integrated model will predict the  optimum location of the OPTIMUM measuring heads for a defined end  effector path trajectory.  • Create observer-based models that are robot pose-dependent, which  enable prediction of other states, including velocities and accelerations.  These will be validated experimentally.  • Validate closed loop performance experimentally through a programme of  path trajectories and machining (drilling/trimming). NPL will use the  OPTIMUM system to provide metrology inputs to the robot control loop.  • Prepare a final report and submit a paper to a peer-reviewed journal for  open access publication.  The job holder would be part of a team, hence would not necessarily cover every  aspect mentioned above. However, a willingness to learn new techniques is  essential. There would also be a requirement to produce further excellent research  outputs and publish them as journal and conference papers/presentations. |

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| **Job purpose** |
| To provide subject-specific research expertise and undertake specific research work to a Principal Investigator (PI)/Co-Investigator (CI) and their research team for a specified grant/project. |

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| **Main duties and responsibilities** | |
|  | Responsible to the PI/CI for (as appropriate to discipline): |
| **1** | Conduct individual and/or collaborative research projects. Contribute to the design and execution of the project e.g. timetabling and meeting project milestones; participating in regular discussions with collaborative partners. Generate, collect and analyse existing data related to the project using qualitative and/or quantitative techniques. |
| **2** | Writing up results of research and contributing to the publication of results in high-quality peer-reviewed academic literature. |
| **3** | Disseminating results of research project as appropriate to the discipline through activities such as   * overseas research visits * conference presentations * public engagement activities |
| **4** | Participate in departmental/group meetings and prepare and deliver presentations/seminars to project team, internal and external stakeholders or funders. |
| **5** | Assist with the supervision of postgraduate students and undergraduate project students and the assessment of student knowledge. |
| **6** | Continually update knowledge and understanding in field or specialism to inform research activity. |
| **7** | Identify sources of funding and provide assistance with preparing bids to funding bodies. Develop ability to secure own funding e.g. travel grants. |
| **8** | Contribute to the development of research objectives and proposals for own or joint research projects, with assistance of a mentor, if required. |
| **9** | Disseminate knowledge of research advances to inform departmental teaching. |
|  | You will from time to time be required to undertake other duties of a similar nature as reasonably required by your line manager. You are required to follow all University policies and procedures at all times and take account of University guidance. |

**logo-uob-resize[1] Person Specification**

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| **Criteria** | **Essential** | **Desirable** |
| **Qualifications** |  |  |
| A PhD[[1]](#endnote-1) degree in subject area of direct relevance for the project, or equivalent significant relevant experience and professional qualification | √ |  |
| **Experience/Knowledge** |  |  |
| Post doctoral experience |  | √ |
| Demonstrated significant depth and breadth of specialist knowledge of subject matter (Dynamic models and experimental validation) to contribute to research programmes and to the development of departmental research activities | √ |  |
| Experience/Knowledge of kinematic and dynamic system modelling and controller design for robotic machining. | √ |  |
| Using measured displacement signals to implement control strategies | √ |  |
| Demonstrated awareness of latest developments in the field of research and in research design | √ |  |
| Demonstrated potential to publish in high quality, peer reviewed journals | √ |  |
| **Skills** |  |  |
| Ability to prepare research proposals, to conduct individual research work and to disseminate results |  | √ |
| Ability to organise and prioritise own workload to meet required deadlines | √ |  |
| Ability to write research reports and to effectively disseminate outcomes | √ |  |
| Excellent oral, interpersonal and written communication skills | √ |  |
| Proficiency in appropriate techniques (as appropriate to discipline) | √ |  |
| Proficiency in IT skills (as appropriate to discipline) | √ |  |
| **Attributes** |  |  |
| Commitment to working within professional and ethical codes of conduct | √ |  |
| Innovation and developing creative solutions | √ |  |
| Commitment to excellence in research | √ |  |
| Enthusiasm and self-motivation | √ |  |
| Tenacity – working to achieve own and team objectives and to overcome obstacles | √ |  |
| Ability to be an effective team worker | √ |  |
| Commitment to safe working practices | √ |  |

1. *If you have not yet been awarded your PhD, you will need to have submitted your thesis; passed your viva (with or without minor corrections) and receive confirmation of your PhD award within 6 months of appointment.*  [↑](#endnote-ref-1)