



Job Description

Job title	Research Associate
Department/School	Mechanical Engineering
Job family	Education and Research
Grade	7
Reporting to	Principal Investigator (PI)
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

Background and context
<p>Applications are invited for a Postdoctoral Research Associate (PDRA) to take a key role in the design and development of digital hydraulic fluid power technologies and control systems. The role is funded by the UKRI Future Leaders Fellowship, entitled "Digital Hydraulic Fluid Power Technologies for Decarbonising Off-road Vehicles", in collaboration with Moog Controls, JCB, Danfoss Scotland, Oilgear UK, Niftylift, and Global Fluid Power Society. The successful applicant will be based at the University of Bath.</p> <p>Hydraulic fluid power has several advantages, such as high power density, compactness, low weight, fast response, and good controllability. However, the current hydraulic control method involves using valves to throttle flow, reduce pressure, and control the speed and force of the load. Although this approach is simple to operate, it is highly energy inefficient, and the average power efficiency of fluid power systems is only about 21%. This project aims to design, develop and prototype next-generation digital hydraulic technologies and control systems to significantly improve hydraulic energy efficiency, fuel consumption, and CO₂ emissions to decarbonise off-road vehicles for a sustainable and greener future. In addition, there are also opportunities to conduct interdisciplinary research on highly efficient actuation mechanisms, collaborating with colleagues nationally and internationally.</p>

Job purpose
<p>The PDRA will be responsible for delivering high-quality research on the topic, including:</p> <ul style="list-style-type: none">• Design and modelling of digital hydraulic fluid power technologies.• Prototyping, validating and evaluating digital hydraulic converters.

- Digital fluid power system integration and experimental validations.
- Stimulating and creating pathways to impact and disseminate the research outcomes and promote the exploitation of the new technologies.

This role will suit you if you

- Hold a PhD degree in a subject area of direct relevance for the project.
- Have previous experience in one or more of the following: modelling, design, control or prototyping of fluid power components and systems.
- Have excellent analytical, problem-solving, and project management skills.
- Are self-motivated and have excellent communication skills.

You will be responsible for planning and performing your own research activities and will be expected to take an active role in supporting PhD and undergraduate research students within the laboratory. You should have excellent interpersonal and communication skills to work as part of a team and discuss your work with a range of audiences.

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 <ul style="list-style-type: none"> • 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.	

Person Specification

Criteria	Essential	Desirable
Qualifications		
Undergraduate degree (e.g. BA, BSc, BEng) PhD degree in subject area of direct relevance for the project; or	√	
Professional/Industrial/Creative Doctorate in subject area of direct relevance for the project (e.g. DBA, MD, EdD, PsyD, EngD, DA); or	√	
Professional qualification (e.g. Chartership) and relevant experience equivalent to that of a PhD; or		
Professional experience in relevant discipline equivalent to that of a PhD		
Experience/Knowledge		
Post doctoral experience		√
Demonstrated significant depth and breadth of specialist knowledge of subject matter to contribute to research programmes and to the development of departmental research activities	√	
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	√	