Candidate Brief

Job Title	Research Fellow (Human-Robot Teaming)	**Reference**	26/113714
School/Department	School of Electronics, Electrical Engineering and Computer Science	**Salary**	£42,972 per annum
Duration	20 months	**Hours of Work**	Full Time

About the Job

We are seeking an outstanding researcher to contribute to the HARMONICA project, an EU Horizon-funded Research and Innovation Action advancing Europe's recycling sector towards a human-centric Industry 5.0 model. The post will focus on adaptive human-robot teaming: developing intelligent systems that understand a human team member's changing cognitive and physical state and dynamically adapt robot behaviour and autonomy in complex shopfloor environments.

The successful candidate will work at the intersection of Human-Robot Interaction (HRI), human-centred AI, multimodal sensing and machine learning, developing real-time approaches that enable robots and semi-autonomous mobile manipulators to respond appropriately to human workload, attention, capability and performance.

Key Responsibilities

1. Develop models for estimating human cognitive and physical state using real-time behavioural, physiological and/or multimodal data.
2. Implement machine learning and adaptive algorithms for human-robot team decision-making, drawing on existing toolkits (such as MNE-Python) and established approaches from cognitive and physiological modelling.
3. Investigate dynamic and adjustable robot autonomy, enabling robots and mobile manipulators to increase or decrease their level of autonomy in response to changing human state and task demands.
4. Develop methods for multimodal data fusion and real-time state estimation, contributing to the project's Psy-PhyTwin models.
5. Design and evaluate human-robot interactions, including the effects of adaptive autonomy on workload, trust, performance, situation awareness and safety.
6. Integrate human-state models with robotic systems to enable real-time adaptive decision-making and safety interventions.
7. Contribute to experimental design, data collection, analysis and evaluation with human participants, including validation in HARMONICA's living labs.
8. Work collaboratively with researchers across AI, robotics, HCI, human factors and the project's industrial and academic partners.
9. Disseminate research through high-quality publications, conferences, stakeholder engagement and research funding activity.

10. Assist grant holder in the preparation of funding proposals and applications to external bodies.
11. Carry out routine administrative tasks associated with the research project/s to ensure that project/s are completed on time and within budget. These might include organisation of project meetings and documentation, financial control, risk assessment of research activities.
12. Any other duties which fall within the general ambit of the post.

The duties above reflect the main elements associated with this position. They are not intended to be exclusive or exhaustive, and can change periodically in line with emerging priorities, and as directed by the manager.

Eligibility Criteria

All listed criteria, both essential and desirable, will be scored at interview (and via any other method used in the selection process, such as presentation, test, etc.). However, the criteria listed below as ‘assessed at shortlisting’ will be used to select candidates for the next stage in the process, normally an interview.

The panel will define any terms such as ‘relevant’ and ‘recent’ in accordance with the duties and responsibilities of the post. Please remember that ‘substantial’ and ‘significant’ do not relate exclusively to length of experience, but to a combination of considerations, including depth of experience, level of responsibility and whether the experience was gained as a core function of a current or previous role.

Essential Criteria		Assessed at Shortlisting	Assessed at Interview
Education and Qualifications			
1.	Have or be about to obtain a PhD in a relevant area such as: Human-Computer Interaction, Human-Robot Interaction, Artificial Intelligence / Machine Learning, Human Factors / Cognitive Systems, Computer Science or a closely related discipline.	✔	✔
Experience			
2.	Significant, recent, relevant experience to include: Human participant experimental design; Human cognitive/workload modelling; Multimodal sensing and data fusion; Time-series or real-time data analysis; Human-Robot Interaction; Adaptive or shared autonomy; Human factors and experimental evaluation, and; Real-time intelligent systems.	✔	✔
3.	Demonstrable experience in programming/scripting, beyond that taught in undergraduate engineering courses.	✔	✔
4.	A proven track record of using relevant techniques to carry out analyses, critical evaluations, and interpretations of data in a research context.	✔	✔
Other Skills and Abilities			
5.	Practical problem-solving skills, independence of thought and initiative.		✔
6.	Ability to communicate complex information effectively in oral and written format.		✔
7.	Ability to build relationships to develop internal and external networks.		✔
8.	Ability to assess and organise resources.		✔
Special Requirements			
9.	Willingness to undertake additional training in research methods and other related skills as required.	✔	
10.	Willingness to travel to meet the requirements of the research project.	✔	

Desirable Criteria*		Assessed at Shortlisting	Assessed at Interview
Experience			
1.	A publication record which is commensurate with career stage and experience.	✔	✔
2.	Experience running and maintaining physiological/behavioural sensing experiments and equipment.	✔	✔
Other Skills and Abilities			
3.	Knowledge of EEG, ECG, EDA and facial expression sensors.		✔
4.	Familiarity with the MNE toolbox or similar cognitive/physiological signal-processing tools		✔

* Please note that, in cases where a large volume of applications is received for the role, any of the desirable ‘education and qualification’ or ‘experience and knowledge’ criteria may also be used to shortlist candidates for the next stage. In such circumstances, panels may also carry out a further assessment of the depth and breadth of evidence provided in the application in response to the shortlisting criteria or, exceptionally, the essential criteria may be enhanced.