BU STUDENTSHIPS 2024

PROJECT DESCRIPTION

PROJECT TITLE
Federated clustering of multi-modal data

PROJECT SUMMARY
We are seeking talented and enthusiastic candidates to join the EU-funded ARTEMIS project, working towards the development of machine learning and data mining, and AI methods with application in the medical field. The position will be suitable for any profile in computer science, engineering, mathematics, statistics or from other science disciplines with knowledge in machine learning and AI (specifically federated learning, data fusion and clustering) and basic knowledge of computer systems. The successful candidate will investigate and develop federated learning methods for both scalable and privacy-guaranteed clustering and classification. The focus is mostly on longitudinal multimodal data (potentially involving imaging, clinical, biology and multi-omics data), where representation learning, and data fusion are of high importance. The exact scope of the PhD work/project will be tailored, depending on the candidate's profile in a way to contribute to the delivery of the project by conducting relevant research leading to publishable outputs. The researcher will have access to funding for international travel, e.g., for attending conferences, attending the consortium meetings, and research dissemination, while working in a supportive, collaborative, inclusive and non-discriminating working environment. We welcome candidates from all backgrounds to apply. The researcher will be affiliated with the Data Science & Intelligent Systems based at the Computing & Informatics Department. The group is very dynamic, ambitious, well networked and delivers state-of-the-art research in a range of machine learning and data science topics, publishing research results in prestigious venues.

PGR DEVELOPMENT OPPORTUNITIES
The PGR will be provided with a range of development opportunities via BU's Doctoral College Research Development Programme, Faculty training and bespoke skills related directly to the project

SUPERVISORY TEAM	
First Supervisor	Prof Hamid Bouchachia
Additional Supervisors	To be confirmed
Recent publications by	• Allaoui, M., Kherfi, M.L., Cheriet, A. and Bouchachia, A., 2024. Unified

supervisors relevant to this project	embedding and clustering. Expert Systems with Applications, 238.
	- Khennour, M.E., Bouchachia, A., Kherfi, M.L. and Bouanane, K., 2023. Randomising the Simple Recurrent Network: a lightweight, energy-efficient RNN model with application to forecasting problems. Neural Computing and Applications, 35 (27), 19707-19718. - Wang, Y., Wang, X., Arifoglu, D., Lu, C., Bouchachia, A., Geng, Y. and Zheng, G., 2023. A Survey on Ambient Sensor-Based Abnormal Behaviour Detection for Elderly People in Healthcare. Electronics (Switzerland), 12 (7). - Mohamad, S., Alamri, H. and Bouchachia, A., 2022. Scaling up stochastic gradient descent for non-convex optimisation. Machine Learning, 111, 4039-4079. - Jamil, W. and Bouchachia, A., 2022. Iterative ridge regression using the aggregating algorithm. Pattern Recognition Letters, 158, 34-41. - Jamil, W. and Bouchachia, A., 2021. Competitive Normalized Least-Squares Regression. IEEE Transactions on Neural Networks and Learning Systems, 32 (7), 3262-3267. - Pedrosa, J., Bouchachia, H. et al., 2021. LNDb challenge on automatic lung cancer patient management. Medical Image Analysis, 70.

INFORMAL ENQUIRIES

Please contact the lead supervisor on the following email for informal enquiries: Professor Hamid Bouchachia email: abouchachia@bournemouth.ac.uk

ELIGIBILITY CRITERIA

The BU PhD and MRes Studentships are open to UK, EU and International students.

Candidates for a PhD Studentship should demonstrate outstanding qualities and be motivated to complete a PhD in 3 years and must demonstrate:

- outstanding academic potential as measured normally by either a 1st class honours degree (or equivalent Grade Point Average (GPA) or a Master's degree with distinction or equivalent
- an IELTS (Academic) score of 6.5 minimum (with a minimum 6.0 in each component, or equivalent) for candidates for whom English is not their first language and this must be evidenced at point of application.

HOW TO APPLY

Please complete the online application form by **the deadline on the project webpage.**

Further information on the application process can be found at: www.bournemouth.ac.uk/studentships