

## RESEARCH STUDENTSHIP

All studentships are highly competitive, and you should ensure (and demonstrate) that there is a good match between your own qualifications and interests and those being sought for the particular studentship.

Research School where studentship will be held	Computer Science Research Centre, Faculty of Natural Sciences, Keele University.
Studentship reference	<b>FNS_BAIBander_February24</b>
Web link to any further information (e.g. Research Institute/School/Faculty)	Computer Science Research Centre: <a href="https://www.keele.ac.uk/scm/research/computerscienceresearch/">https://www.keele.ac.uk/scm/research/computerscienceresearch/</a>  Faculty Research Office: <a href="https://www.keele.ac.uk/natsci/research/">https://www.keele.ac.uk/natsci/research/</a>
Research topic or field - title	Enhancing Structural Health Monitoring with eXplainable Artificial Intelligence
Research topic or field full description (or attached document).	<p>After a fire incident, analysing post-fire images and videos plays a critical role in assessing structural damage, identifying potential collapse risks, and enhancing the efficiency of rescue operations. By scrutinising these visual data sources, structural engineers can closely examine the extent of damage to buildings, bridges, or other structures, allowing for a thorough assessment of their stability and integrity. This analysis provides invaluable insights into areas where the structural integrity may have been compromised, such as weakened support beams or damaged load-bearing walls, helping to identify immediate risks of collapse. Moreover, leveraging Artificial Intelligence (AI) and Computer Vision techniques, can automate and expedite this process, enabling rapid assessment of large-scale damage scenarios. As a result, rescue teams can make informed decisions about where to focus their efforts, prioritising areas with the highest risks and potentially saving lives by intervening promptly.</p> <p>This PhD project aims to leverage the capabilities of the eXplainable Vision Transformer (ViT) architectures, an innovative model in the field of artificial intelligence and computer vision, to identify structural damage from fire data and predict the behaviour of buildings during fires, ultimately leading to the construction of safer and more fire-resistant structures. The data required for this project will be supplied by an external Canadian partner. The datasets will comprise images and videos demonstrating the testing of a new blue light technique that enhances the clarity of images/videos taken during fire situations.</p> <p>This project provides an interdisciplinary training opportunity for integrating structural engineering with computer science. The student would attend modules in both disciplines to establish a strong foundational understanding and collaborate on research projects merging computational AI techniques with structural analysis and design, gain hands-on experience through real-world projects, participate in workshops and seminars to stay abreast of advancements, and receive mentorship from experts in both fields. This holistic approach aims to equip the student with the skills, knowledge, and experience necessary to tackle complex challenges at the intersection of structural engineering and computer science, facilitating contributions to both academic research and practical applications.</p> <p><b>Research Context:</b> Computer Science and Structural Engineering. The research will be supervised by Dr <a href="#">Baidaa Al-Bander</a> in the Centre for Computer Science Research at Keele University and Dr <a href="#">Rwayda Al Hamd</a> in School of Applied Sciences at Abertay University.</p>

Expected start date	Available now
Mode of attendance	Full-time, Part-time, Distance-learning (FT/PT)
Funding support available – Fees, stipend, duration	<p><b>Self-funded:</b> Please note that self-funded applicants must provide funding for both tuition fees and living expenses for the 3-year duration of the research. There is a future possibility of competitive scholarship awards for outstanding applicants. However, none are currently available. For information regarding University tuition fees, please see: <a href="http://www.keele.ac.uk/pgresearch/feesandfinance/">http://www.keele.ac.uk/pgresearch/feesandfinance/</a></p> <p>Students are also provided with access to Faculty research training funds for research related expenses including - but not limited to - conference attendance, external training courses.</p>
Source of funding	<p>This opportunity is for self-funded applicants only (for example, international students with government or industry sponsorship and UK students with Doctoral Loan funding: <a href="https://www.gov.uk/doctoral-loan">https://www.gov.uk/doctoral-loan</a> ).</p>
Eligibility criteria	<p>Applications are welcomed from Computer Science/Engineering graduates with (or anticipating) at least a 2.1 honours degree or equivalent. Applicants should have good computing skills and an enthusiasm for coding, designing, and testing. They should be self-motivated and able to work independently and as part of a team.</p> <p>This opportunity is open to UK/EU and overseas students. The collaborative and presentation aspects of the research require good English language and communication skills. Overseas applicants would, therefore, require an English IELTS (or equivalent) of 6.0 overall with no less than 5.5 in any subtest.</p>
Terms and conditions of studentship	As per the <a href="#">University Code of Practice</a>
Number of studentships available	N/A
Application details	<p>Please go to <a href="http://www.keele.ac.uk/pgresearch/studentships/">http://www.keele.ac.uk/pgresearch/studentships/</a> and click on the "Apply online here" button in this studentship. Please quote <b>FNS_BAIBander_February24</b> on your application.</p>
Closing date for applications	Applications are welcome all year round.
Contact for further information and to whom applications will be sent	<p>Informal enquiries about the project are very welcome by email to Dr Baidaa Al-Bander (<a href="mailto:b.al-bander@keele.ac.uk">b.al-bander@keele.ac.uk</a>) and Dr Rwayda Al Hamd (<a href="mailto:r.al-hamd@abertay.ac.uk">r.al-hamd@abertay.ac.uk</a>). Full applications should be submitted to: <a href="https://www.keele.ac.uk/study/postgraduateresearch/researchareas/computerscience">https://www.keele.ac.uk/study/postgraduateresearch/researchareas/computerscience</a></p> <p>(For candidate profile, please see page 3 of this advert)</p>

## Candidate profile

	Essential	Desirable
<b>Qualifications, Experience and Skills</b>	<p>Applications are welcomed from Computer Science/Engineering graduates with (or anticipating) at least a 2.1 honours degree or equivalent.</p> <p>Good knowledge in AI, machine learning, computer vision techniques is essential for developing algorithms to analyse fire data and predict building behaviour.</p> <p>Proficiency in programming languages such as Python is necessary for implementing AI algorithms, processing datasets, and developing solutions.</p>	<p>Knowledge of fire dynamics and behaviour in structures would be beneficial for understanding the context of the data and enhancing the accuracy of predictive models.</p>
<b>Attitude and Personality</b>	<p>Applicants should have an enthusiasm for design and experimentation as well as a willingness to acquire new skills. Ideally, applicants will be self-motivated and have the ability to work both independently and as part of a team.</p> <p>Good interpersonal skills</p> <p>Ability to initiate, plan, organise, implement and deliver programmes of work</p> <p>Willingness to learn new skills</p>	

Keele University values diversity, and is committed to ensuring equality of opportunity. In support of these commitments, Keele University particularly welcomes applications from women and from individuals of black and ethnic minority backgrounds for this post. More information is available on these web pages:

<https://www.keele.ac.uk/equalitydiversity/>

<https://www.keele.ac.uk/athenaswan/> <https://www.keele.ac.uk/raceequalitycharter/disabilityconfident/>