# Internship Posting Form

| Section A: Host Organization | |
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| **Host Organization Name** | University of Leeds |
| **City** | Leeds, UK |
| **Primary Contact** (First and Last name) | Prof Vasilis Sarhosis |
| **Primary E-mail** | v.sarhosis@leeds.ac.uk |
| **Position Title / Office** | Professor of Resilient Structures and Infrastructure |
| **Section B: Internship Information** | |
| **Internship Project Title** | Use of computer vision and machine learning for automatic identification of cracks in masonry and concrete structures from photos |
| **Department/Faculty** (if applicable) | Faculty of Engineering and Physical Science |
| **Supervisor Name** | Prof Vasilis Sarhosis |
| **Supervisor's Email** | v.sarhosis@leeds.ac.uk |
| **Length of internship** | 3 to 6 months |
| **Start date** | As soon as possible |
| **End date** | TBC – Dependent on start date |
| **Hours** (per week) | 37.5 |
| **Language Requirement for Workplace** | English |
| **Description of Host** | Professor Vasilis Sarhosis<br><br>The University of Leeds is a public research university in Leeds, West Yorkshire, England. It was established in 1874 as the Yorkshire College of Science. In 1884 it merged with the Leeds School of Medicine (established 1831) and was renamed Yorkshire College. In 1904 a royal charter was granted to the University of Leeds by King Edward VII.<br><br>Leeds is the eleventh-largest university in the United Kingdom by total enrollment and receives over 67,000 undergraduate applications per year, making it the fifth most popular university (behind Manchester, Edinburgh, University College London and King's College London) in the UK by volume of applications. Leeds had an income of £924.7 million in 2021–22, of which £177.3 million was from research grants and contracts. The University has financial endowments of £87.4 million (2022), placing it within the top twenty British universities by financial endowment.<br><br>Notable alumni include current Leader of the Labour Party Sir Keir Starmer, former Home and Foreign Secretary Jack Straw, former co-chairman of the Conservative Party Sayeeda Warsi, NASA astronaut Piers Sellers and six Nobel laureates. |

| | With respect to the School of Civil Engineering, our research contributes to delivering the infrastructure that we all rely on in everyday life. We have an ethos of working at the interfaces with other disciplines to tackle key societal and technical challenges, and our research has an impact on a global scale. Our research is supported by dedicated and experienced technical staff and first-class laboratory and computing facilities. |
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| **Position Description** (describe the duties and responsibilities of the intern) | Maintenance and condition assessment of infrastructure are vital as they are the country's critical network. Cracks are considered to be the primary concern for the durability and safety of existing structure. Therefore, crack detection is very important for the maintenance of structures and must be detected at the earliest stage to avoid unwanted situations, such as damage to buildings and bridges, or the collapse of structure due to severe cracks.<br><br>Visual inspection is a common procedure that is used in the examination and assessment of the current state of our existing and ageing infrastructure. However, this procedure is laborious and time-consuming as it requires the experience and specialised knowledge of inspectors to assess structural conditions based on the visual appearance of structures. Furthermore, the procedure cannot be conducted frequently due to high labour cost and prone to human error, and often the sites cannot be easily inspected due to inaccessibility. This internship will develop approaches for registering and measuring cracks from infrastructure using remote sensing e.g. laser scanning and photogrammetric data from UAVs and robots.<br><br>Objectives: An algorithm is going to be developed here which will be able to trace quantitative measurements of cracks, as well as global positioning system (GPS) data to locate the detected crack on the structure. The algorithm will be later incorporated in a mobile application for use by engineers and the public.<br><br>Outcome: A mobile application that can be used to record and monitor cracks from our existing and ageing infrastructure. The mobile app could be used by engineers and the public in emergency response situations. The device can be even installed in robots and UAVs for capturing cracks in areas in which humans cannot reach (e.g. bridges and nuclear power plant). |
| **Qualifications** (including specific skills, areas of study, language competencies) | Computer science, machine learning, computer vision, civil engineering. |
| **Additional Information** (please include specific skills, areas of study, year of study required) | |