PhD Scholarship:
Augmenting Sustainability Metrics through use of Artificial Intelligence (ASMAI)

Description: Sustainability is comprised of three key components - environmental, economic and social aspects - all of which must be assessed and balanced in order to improve existing or develop new sustainable products, services and/or systems. The inputs, outputs and impacts of these criteria are measured using Life Cycle Sustainability Assessment (LCSA) methods and tools, which support informed decision making across many industrial and business sectors. LSCA is enhanced by Materials Criticality Assessment, an increasingly important means of monitoring supply chain risk and security for a group of resources of high economic and technical importance. Although LCSA and MCA are valuable aids to global sustainability, they are time- and resource-intensive, so that consequently they are often ignored, or under or poorly utilised. There is enormous potential to employ and integrate AI into LCSA and MCA activities, in order to accelerate both the development of sustainable practice and the shift from linear to circular economies. Use of AI in LCA is a nascent activity and as such, this project offers potential for world leading innovation that will directly augment sustainability metrics and encourage more informed sustainable development.

This PhD is a joint venture between LSBU, WeLOOP (a globally renowned sustainability consultancy based in France) and Operational Intelligence (UK-based data centre sustainability consultancy). There is already evidence that machine-learning methods are being tested in line with environmental impact (Life Cycle) assessment. However many are inappropriate and not only provide inferior results to those from comparative LCAs, but additionally they either fail to produce results for or produce inaccurate results for a number of impact categories, which skews overall results. The main project objectives and outcomes for the PhD candidate are to:

- develop AI-based systems that increase scope and speed of LCSA activities
- generate AI systems that facilitate longer-term predictions for future products
- combine environmental, economic and social impact assessment methods to improve accuracy of LSCA results and data sets
- increase monitoring of materials criticality and supply chains
- engage in high-quality research and publication in journal articles
- present project findings at international conferences

This is a 3 year fully funded studentship for UK/EU and overseas applicants who are keen to conduct research in AI, have an interest in sustainability, are willing to learn about Life Cycle Sustainability Assessment in the School of Engineering at LSBU and to travel to WeLOOP in France.

Supervisory Team: The successful applicant will work with Dr Deborah Andrews and Dr Enrico Grisan at LSBU, Dr Naeem Adibi (at WeLOOP) and Operational Intelligence.
As a PhD student, you will work alongside a range of academics and researchers in a collaborative environment within the London Centre for Energy Engineering and Centre for Bioengineering.

Requirements: Applicants must be of outstanding academic merit and should have (or be expected to gain) either a first class or upper second class Honours degree (or the international equivalent), or an MSc/MRes with distinction. Enthusiastic and self-motivated candidates from all countries with a background in either AI, computer science or a related discipline are encouraged to apply. Please submit your **CV** and a 1 page **Letter of Application (mandatory)** explaining why you are interested in this PhD and how you match the requirements of the role by 27.02.2022.

This PhD is a School of Engineering Bursary covering fees and a £18k stipend per annum for three years. As part of the candidate's academic development, the bursary agreement includes that the successful PhD candidate engages in 4 hours per week student contact time, comprising lab class assistance and extracurricular activity development. If you have any, informal queries please email the supervision team directly. We encourage applications from underrepresented groups.