

Project Reference: CTE_BBRC_Grisan_001_25_26

About the Project

This is an exciting PhD opportunity within the College of Technology and Environment (CTE) at London South Bank University (LSBU). The successful candidate will receive a fully funded scholarship (tuition fee waiver and stipend) beginning in September 2025 for 3 years, plus tuition fee waiver for the additional write-up year.

Project Title:

AI-Driven Endoscopy Biomarkers for Intestinal Inflammation Assessment

The intestinal barrier is a dynamic interface between the luminal contents, including nutrients, commensal and pathogenic microbes, and the gastrointestinal mucosa. The role of barrier dysfunction is a significant area of research interest in developing targeted treatment of chronic inflammatory gastrointestinal conditions, such as inflammatory bowel disease. However, assessing the barrier's integrity, identifying its alterations, and quantifying biomarkers are still based on histological assessment, requiring the acquisition of multiple colon biopsies and losing all in vivo information about barrier functionality.

Recent advances in endoscopic imaging, such as confocal and endocytoscopy, now permit high-resolution, in vivo visualisation of the mucosa, with vascular and near-cellular detail at 1 micron per pixel (1). These technologies enable real-time imaging of red blood cells moving along vessels and microvessels, goblet cells, the villi epithelium lining, colon crypts, and vascular leakage. When integrated with conventional modalities (endoscopy, ultrasound, histology), such approaches offer a more comprehensive functional characterisation of mucosal inflammation and a better prediction of the risk of recurrence.

Aim 1: To develop a suite of computer vision and AI tools for the analysis of endocytoscopy and confocal endomicroscopy, and ultrasound data, to detect the main anatomical features and derive functional and architectural biomarkers of mucosal integrity, enabling real-time assessment of barrier dysfunction and prediction of recurrence.

Aim 2: To construct a multimodal AI model that can integrate the information from the different modalities -images and clinical dataset- to stratify patients based on inflammatory profiles and biomarker patterns, ultimately improving precision in monitoring, prognosis and therapeutic response..

Team: The supervisory team is collaborating with Prof Iacucci and Prof Ghosh at the University College Cork School of Medicine, who are leading a wider clinical consortium. This collaboration will provide access to advanced endoscopy data, classical endoscopy, ultrasound data, and clinical evaluation of patients.

Who Are We Looking For?

- Open to any UK or international candidates. Starting in September 2025.
- The candidate must meet the minimum entry requirements for our PhD programme by clicking the '[Apply](#)' link.
- A background in either Computer Science, Engineering, or related subjects is essential
- Previous experience in machine learning/deep learning and computer vision is essential
- Previous knowledge or experience in imaging or biomedical imaging is highly desirable.

Selection Criteria:

- Academic Qualifications - You should normally have at least a 2.1 honours degree from a UK University or an equivalent qualification in engineering, computer science, etc.
- Research and Analytical Skills – Ability to research subjects using libraries, the internet, and other information resources, ability to conduct comprehensive literature reviews, experience in qualitative and quantitative data collection and analysis, strong research design and methodology skills, ability to independently collaborate with stakeholders, and excellent academic writing and communication skills.
- **Professional Skills** - Project management and organisational skills, ability to work independently and as part of a team, problem-solving and critical thinking skills, and adaptability and willingness to learn new skills.
- Software and Modelling Experience - Experience developing and utilising computer vision, machine learning, and deep learning models and computational pipelines in Python
- Communication Skills—The candidate should be highly motivated, able to collaborate, have good visual, oral, and written communication skills, and communicate the work's outcomes to commercial, industrial, and scientific audiences.
- Teamwork and Collaboration - Ability to work with industrial and academic supervisors.
- Language Proficiency - Overseas applicants must have a minimum English language IELTS score of 6.5, with at least 5.5 in any of the components.
- Understanding of Equality and Diversity - Able to demonstrate an understanding of equality and diversity and their practical applications.
- Visa and Legal Requirements - Non-EU/EEA nationals may need to apply to the Foreign and Commonwealth Office (FCO) for clearance from the Academic Technology Approval Scheme (ATAS).

Training & Development Opportunities

Doctoral students at London South Bank University ([LSBU](#)), through the London Doctoral College ([LDC](#)), benefit from a rich and structured training environment designed to support academic excellence and professional development. All PhD candidates are offered a comprehensive programme of workshops and seminars covering essential research skills, including research design, data analysis, academic writing, ethics, and project management. These sessions aim to support students through every stage of their doctoral journey—from literature review and methodology to thesis completion and viva preparation. Postgraduate researchers can access advanced, discipline-specific training aligned with their research focus. LSBU's doctoral training environment is designed to build deep expertise in a chosen research area and the broader skills necessary for successful careers in research, industry, and beyond.

About the College

The College of Technology and Environment (CTE) at London South Bank University (LSBU) is a newly formed academic college, launched in January following the university's recent reorganisation. Led by Executive Dean Professor Chris Harty, CTE brings together four schools: Architecture & Planning, Construction, Property & Surveying, Engineering & Design, and Computer Science & Digital Technologies. The college fosters a collaborative and interdisciplinary environment, addressing the complex challenges of the built and digital environments. CTE strongly emphasises research, with doctoral students playing a key role in shaping and contributing to the college's research agenda. CTE prepares students to become future leaders through innovation, industry partnerships, and a commitment to sustainability. With a focus on real-world impact and academic excellence, the college is set to drive forward LSBU's vision of delivering applied knowledge that transforms lives and communities locally and globally. The university has five centres, and any academic staff and students in the college can join. These research centres are described below.

About the Bioscience and Bioengineering (BB) Research Centre

The [Bioscience and Bioengineering Research Centre](#) advances understanding of health and disease through biological research and innovative technologies. Our interdisciplinary team focuses on

improving diagnostics, treatments, and patient management across healthcare settings. Areas of expertise include cancer biology, bioinformatics, pharmacokinetics/pharmacodynamics, biomedical imaging (ultrasound, optical, MRI, PET, microwave), and biomedical signal and image analysis. We also explore human biomechanics and the mechanical properties of muscle and tendon in both healthy and diseased states. By integrating science and engineering, we strive to translate cutting-edge research into real-world healthcare improvements that benefit patients and practitioners alike.

Contact Person

Before applying, please contact the main supervisor, **Enrico Grisan**, Associate Professor in AI at the School of Computer Science and Digital Technologies, College of Technology and Environment.

E-mail: enrico.grisan@lsbu.ac.uk

In your email, include:

- A curriculum vitae
- Details of your current level of study and academic background.
- A summary of any relevant experience.
- A brief paragraph about your motivation for pursuing this PhD project.

Fee Waiver

The fee waiver is available for 4 years (48 months), including the writing-up year, examination period, and submission of the corrected thesis.

How to apply

Applications should be submitted via the programme page using the links below:

<https://www.lsbu.ac.uk/study/course-finder/computing-science-informatics-phd>

You should upload the problem statement, qualifications, CV, and other relevant documentation to the application portal. Remember to state the correct reference number and the appropriate supervisor.