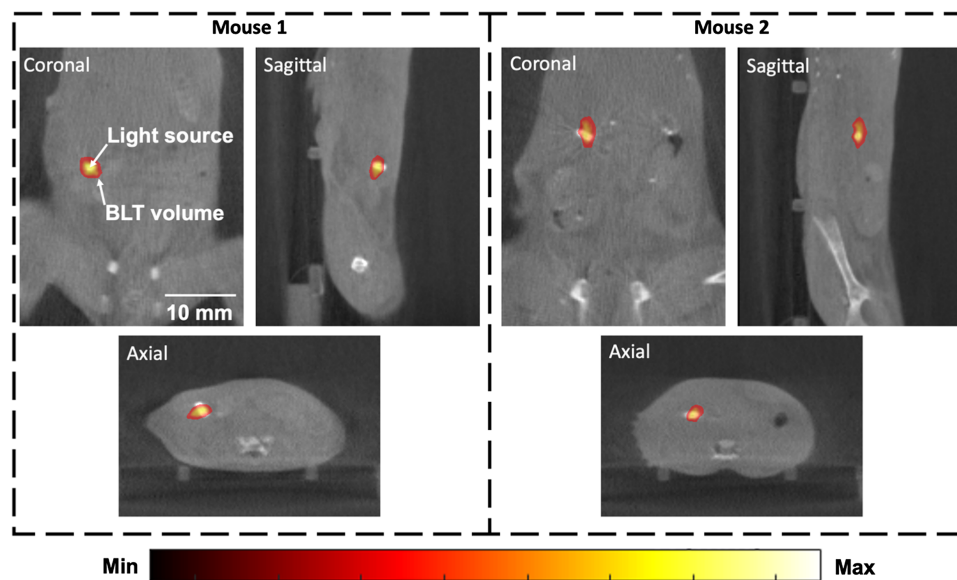Autumn 2023

Optics & Photonics Group Lunchtime Seminar Series

University of Nottingham

Applying molecular imaging in pre-clinical studies; from system development to computation

Alex Bentley
University of Nottingham

13:30 Wednesday 1 November 2023
Coates Building – C24

OPTICS & PHOTONICS
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Alex Bentley

Applying molecular imaging in pre-clinical studies; from system development to computation

Photonics based imaging is a widely utilised technique for the study of biological functions within pre-clinical studies. Specifically, bioluminescence imaging is a sensitive non-invasive and non-contact optical imaging technique that can detect distributed (biologically informative) visible and near-infrared activated light sources within tissue, providing information about tissue function. Compressive sensing (CS) is a method of signal processing that works on the basis that a signal or image can be compressed without important information being lost. This seminar outlines the development, testing and validation of a CS based hyperspectral Bioluminescence imaging system that is used to collect compressed fluence data from the external surface of an animal model, due to an internal source, providing lower acquisition times, higher spectral content and potentially better tomographic source localisation.

Often it is the case where the optical parameters of the small animal are unknown leading to the use of a 'best' guess approach or to direct measurements using either a multi-modal or dedicated system. Using these conventional approaches, can lead to both inaccurate results and extending periods of imaging time. This seminar also introduces the development of an algorithm that is used to accurately localize the spatial light distribution from a bioluminescence source within a subject by simultaneously reconstructing both the underlying optical properties and source spatial distribution and intensity from the same set of surface measurements.

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All are welcome

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