Seminar Series:
Latest Breakthroughs in Biomedical Engineering Research

Location: DBE Science Lounge, Hegenheimermattweg 167C, 4123 Allschwil
Date & Time: Thursday 24.10.2024 | 15:30 – 16:30
Host: Prof. Beat Müller & Dr. Joël Lavanchy

Advancing Precision in Surgical Workflow Analysis through Detailed Tool-Tissue Interaction and Dynamic Tool Tracking

Chinedu Nwoye

IHU Strasbourg and University of Strasbourg

Abstract

My research advances fine-grained modeling of surgical workflows, moving beyond traditional phase detection to deliver actionable insights for real-time assistance. By developing surgical action triplet recognition (tool-verb-target) and precise tracking across intraoperative, intracorporeal, and visibility perspectives, my work provides a more comprehensive understanding of surgical procedures. This approach enhances AI-based interventions, improving decision-making, surgical precision, and patient safety while offering insights that simpler methods cannot achieve.

Biosketch

Dr. Nwoye is an adjunct lecturer at University of Strasbourg France and a post-doctoral research fellow at CAMMA IHU Strasbourg, where he leads pioneering efforts in Surgical Generative AI research and development. His other research interests include Deep Learning and its applications in surgical assistive interventions, surgical workflow analysis, intraoperative adverse events detection, and Federated Learning. He served as the principal organizer of the MICCAI Endoscopic Vision Biomedical Challenge on CholecTriplet, a groundbreaking initiative that models surgical activities through the representation of (tool-action-anatomy) relationships and Area Chair IPCAI 2024.