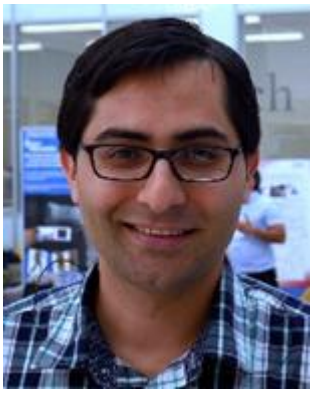
Prof. M. Hadi Sadati
Assistant Professor, Queen Mary University of London (QMUL), UK
www.smh-sadati.com



Abstract:
At ACEi group (Artificial, Collective, Embodied intelligence), we envision revolutionizing endoluminal catheterization through the integration of soft robotics, embodied intelligence, and artificial intelligence. This innovation aims to enable minimally invasive interventions deep within the body via automated multi-modal tissue and endoluminal navigation.
Typically, medical access to vital organs is achieved through direct open surgery, laparoscopy, needle-sized incisions, or navigating body lumens. While a close entry site is often preferred to reduce surgery time, remote entry sites, such as the groin for endovascular interventions, can be used due to limited haemorrhage and recurrent stroke risks. These body lumens act as highways to the intervention site, minimizing risks like secondary stroke, excessive arterial bleeding, and damage to proximal nerves.
Safe access and effective navigation within body lumens, such as blood vessels and cerebrospinal fluid pathways, provide comprehensive access to most organs. Imagine a stable, leakage-proof incision to exit the body lumen and continue navigation in surrounding tissue for even deeper access, reaching areas not immediately adjacent to blood vessels. ACEi's vision is to make such multi-modal navigation for deep body access possible. Robotic Mechanical Thrombectomy and Neuroendoluminal catheterization are key clinical applications that underpin this vision. This talk presents an overview of our theoretical, artificial, and embodied intelligence frameworks, demonstrating their application in intelligent endoluminal navigation and intervention.

Short biosketch:
Dr. M. Hadi Sadati is an Assistant Professor in Robotics and Mechatronics, and the Director of the ACEi Group (Artificial, Embodied, and Collective Intelligence) within the Centre for Advanced Robotics (ARQ) at the School of Engineering and Materials Science, Queen Mary University of London, UK. He earned his PhD in Soft Robotics from King's College London (KCL) in 2018, following an MSc in Mechanical Engineering from Sharif University of Technology (2012) and a BSc from Amirkabir University of Technology (2010), Iran. Dr. Sadati has held research fellowships in Continuum Medical Robotics at KCL (2019–2024) and in Morphological Computation at the University of Bristol (2017–2019). He has also been a visiting researcher at several leading labs, including LASA & CREAT (EPFL, 2019 & 2021), SRL (ETH Zurich, 2021), Prof. Walker's Lab (Clemson University, 2017), and Morph Lab (Imperial College London, 2016–2017). His research interests span soft medical robotics, embodied intelligence, system dynamics, bioinspiration, and smart structures.