FEATURED SPEAKER



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Dr. Jerusalem received his Diplôme d'Ingénieur from Ecole Nationale Supérieure de l'Aéronautique et de l'Espace in France, his Master of Science from Massachusetts Institute of Technology at Cambridge, MA, and his PhD from Massachusetts Institute of Technology from Cambridge. Antoine is a Fellow of St. Hugh's College at the University of Oxford, and EPSRC Fellow, and World Economic Forum Young Scientist His lab focuses on computational modelling of many types of materials and structures with a focus on the multiphysics of neurons and brain, and applications in ultrasound neuromodulation and TBI.

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GOODMAN CAMPBELL
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PRESENTS

PREDICTION OF TISSUE INJURY USING AI-MECHANICS COUPLING METHODS: APPLICATIONS TO THE BRAIN AND WOMEN'S HEALTH

Date: Monday, October 26 **Time:** 4:00 PM-5:00 PM EDT

Location: DLR 131

ABSTRACT

The field of Computational Mechanics of Materials – and in particular its extensive use of the finite element method – has allowed countless predictions of mechanical states in a wide range of disciplines. In clinical applications, however, the final function of the physical system is not always its mechanical integrity. The resulting gap between mechanical state prediction and targeted functional deficits has typically led to many quixotic quests for the right "threshold" for the "right" metrics. However, in a seemingly ever-increasing number of cases, AI has shown promises that seem to bypass the need altogether for mechanical understanding. Unfortunately, the sacrifice of causation for correlation comes at a price and – as we all know – AI is not without limitations. In this talk, we show that coupling mechanics and AI together may allow to circumvent the limitations of one another while improving their overall performances. We then apply this new methodology to injury predictions in the context of traumatic brain injury, and fetal and maternal health during labour.

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