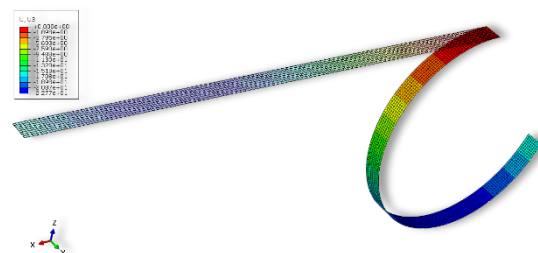
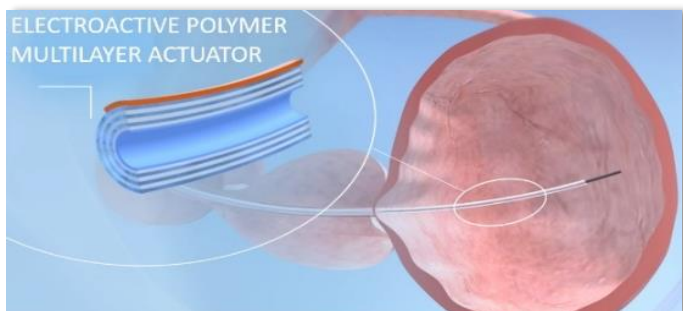


PhD opportunity: MODELIZATION AND DESIGN OF AN ELECTROACTIVE POLYMER ACTUATOR FOR MINI INVASIVE SURGERY ROBOT

The 4-year ANR-funded (French National Research Agency) TEAM gathers industrial (Arkema and Syrobo), academic partners (IMS and PIMM laboratories) and urologist surgeons (Tenon Hospital). Its main objective is to design smart actuators made of electroactive polymers based on fluorinated polymers (EAP) for minimally invasive surgery applications. Their versatile processing, electromechanical properties, and ease of use make the EAP highly relevant for the next generation of endoscopes. This smart material continuum actuator is made of a multilayer composite material (alternating layers of conducting polymers and EAP) that deforms under the electrostrictive effects of its active layers. The objective of the project is to design and fabricate multilayered endoscopes to reduce the applied voltage and increase the bending force. Finite element simulations are developed to optimize their design as well as two possible manufacturing processes, i.e. screen-printing and dip-coating.



PHD TOPIC

We are seeking a highly motivated PhD candidate to join our research team to investigate the multilayer composite actuator and its properties. The successful candidate will be responsible for developing numerical twins of the multilayer composite actuator to optimize its design satisfying the operational requirements. Through this research, the candidate will contribute to understand the relationship between the composition of the EAP and the macroscopic behavior of the actuator. Additionally, the virtual model will serve as a valuable tool for developing the control laws of the EAP endoscopes.

BACKGROUND

Applicants for this PhD position should hold a MS degree in Mechanical Engineering or in Electrical Engineering with minor in Mechanics or Materials Science. Experience in numerical simulations and soft robotics will be appreciated.

INFORMATIONS AND CONTACT

The PhD position will be located at the ENSAM campus in Paris with occasional trips to Bordeaux. Assistance in finding student housing can potentially be provided.

Location: Laboratoire PIMM, ENSAM, 151, boulevard de l'Hôpital, 75013 Paris, France.

Duration: 3 years, starting from October 2023.

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