

Morphing and shape control: from mechano-biology to engineering

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Locomotion strategies employed by unicellular organism are a rich source of inspiration for studying mechanisms for shape control. These strategies are particularly interesting because the organisms and the mechanisms they exploit are invisible to the naked eye, and offer surprising new solutions to the question of how shape can be controlled.

In recent years, we have studied locomotion and shape control in unicellular organisms using a broad range of tools ranging from theoretical and computational mechanics, to experiment and observations at the microscope, to manufacturing of prototypes. The physical models used to demonstrate the mechanisms exploited by biological organism naturally suggest new solutions for adaptable and deployable structures, morphable devices, robotic applications, smart shape-shifting materials and structures. We will survey our most recent findings within this stream of research.