ABSTRACT

The future of work is shaped by the synergy between ubiquitous automation and artificial intelligence. Automation is currently driven by electric motors, which deliver clean mechanical actuation and are even already replacing engines in transportation, in addition to their role in robotics, prosthetics and energy. In this talk, I will describe a roadmap to replace bulky electric motors and exploit instead bioinspired materials, processes and self-organization phenomena for automation.

First, I will describe the use of liquid surface energy to manufacture surface textures by self-organization, as well as to actuate morphing surfaces. Next, I will describe the design and production of artificial muscles which use electric, thermal, or chemical energy to generate contractile motion.

These examples shed light on the future of work propelled by new materials, nonlinear mechanics and unusual manufacturing processes.