

Computational Design of Mechanical Characters

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3D printing is considered a disruptive technology with potentially tremendous socioeconomic impact. In recent years, additive manufacturing technologies have made significant progress, in terms of both sophistication and price; they have advanced to a point where devices now feature high-resolution, full-color, and multi-material printing. Nonetheless, they are of limited use, given the lack of efficient algorithms and intuitive tools that can be used to design and model 3D printable content.

My vision is to unleash the full potential of 3D printing technology with the help of computational methods. In my research, I am working to invent and develop new computational techniques for intuitively designing virtual 3D models and bringing them to the real world. In this talk, I will present our efforts towards a general interactive design system for automatically creating the mechanisms that reproduce the desired motions. This will allow novice users, for example, to create complex 3D mechanical characters that are ready for fabrication. Furthermore, I will address the challenge of designing mechanical automata that can walk in stable and pleasing manners.