北京大学前沿计算研究中心

Center on Frontiers of Computing Studies, Peking University

学术报告

Fabrication-Aware Geometry Processing

面向制造的几何处理

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Abstract: The advent of commodity 3D printing is revolutionizing the way people think about designing and prototyping: a designer can now hold in her hands a 3D object hours after its design is complete, drastically reducing costs and enabling quick iterations over many designs. However, the majority of software tools and algorithms currently used to create, manipulate, and process digital geometry are not fabrication-aware: they model the shape as an abstract entity that often does not satisfy practical requirements such as stability or robustness. This leads to a large gap between the digital design and the physical fabrication — my research strives to fill this gap, providing computational design tools that rely on numerical optimization to create fabrication-ready designs. In this talk, I will present some recent results on the design of masonry and tensegrity structures and show how computation can be used to add textures to complex geometric shapes using hydrographic printing and thermoforming techniques.

Biography: Daniele Panozzo is an Assistant Professor of Computer Science at the Courant Institute of Mathematical Sciences in New York University. Prior to joining NYU he was a postdoctoral researcher at ETH Zurich (2012-2015). Daniele earned his PhD in Computer Science from the University of Genova (2012) and his doctoral thesis received the EUROGRAPHICS Award for Best PhD Thesis (2013). He received the EUROGRAPHICS Young Researcher Award in 2015 and the NSF CAREER Award in 2017. Daniele is leading the development of libigl (https://github.com/libigl/libigl), an award-winning (EUROGRAPHICS Symposium of Geometry Processing Software Award, 2015) open-source geometry processing library that supports academic and industrial research and practice. Daniele is chairing the Graphics Replicability Stamp (http://www.replicabilitystamp.org), which is an initiative to promote reproducibility of research results and to allow scientists and practitioners to immediately benefit from state-of-the-art research results. His research interests are in digital fabrication, geometry processing, architectural geometry, and discrete differential geometry.

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