Machines from Metamaterials

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Host: Bernd Bickel

Digital fabrication machines such as 3D printers excel at producing arbitrary shapes, such as for decorative objects. Recently, researchers started to engineer not only the outer shape of objects, but also their internal microstructure. Such objects, typically based on 3D cell grids, are also known as metamaterials. Metamaterials have been used, for example, to create materials with variable compliance. So far, metamaterials were understood as materialswe want to think of them as machines. We investigated three aspects of such functional metamaterial objects: (1) materials that implement mechanisms based on their microstructures, (2) that employ simple mechanical computation, and (3) interactive metamaterial objects that change their outside to interact with their environment. The main benefit of this approach is that the functionality is solely defined by the objects microstructure, therefore no assembly is required. In this talk, we will look at the mechanics of such microstructures, as well as the software that assists users in creating these. BioAlexandra Ion is a PhD candidate at Prof. Patrick Baudisch's Human-Computer Interaction lab at the Hasso Plattner Institute in Germany. She holds an MSc from the University of Applied Sciences Upper Austria in Hagenberg. Her research focuses on new types of machines, the functionality of which are solely defined by the materials microstructure. She develops software that assist users in creating such intricate structures. Her work has been published in and awarded by premier venues including ACM UIST and CHI.

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IST Austria Campus Big Seminar room Ground floor / Office Bldg West (I21.EG.101)

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