THE UNIVERSITY OF CHICAGO | THE COMMITTEE ON COMPUTATIONAL AND APPLIED MATHEMATICS

COLLOQUIUM

GARY CHOI

Department of Mathematics
Massachusetts Institute of Technology

Geometric and Topological Design of Kirigami Metamaterials

TUESDAY, January 17th, at 4:00 PM
Jones 303, 5747 S. Ellis Ave. Chicago, IL 60637

ABSTRACT

Kirigami, the traditional art of paper cutting, has recently emerged as a promising paradigm for mechanical metamaterials. While many prior works have studied various periodic kirigami tessellations, the computational design of more complex structures is less understood. In this talk, I will present mathematical design frameworks for modulating the geometry and topology of kirigami metamaterials. In particular, by identifying the geometric constraints controlling the contractibility, compact reconfigurability and rigid-deployability of the kirigami structures, we can achieve a wide range of patterns that can be deployed into pre-specified shapes in two or three dimensions. Also, by changing the connections between the kirigami tiles deterministically or stochastically, we can easily control the rigidity of kirigami metamaterials. Altogether, our approaches pave a new way for the design of shape-shifting structures in science and engineering.

Organizers:
Jeremy Hoskins, Department of Statistics (CAMI), jeremyhoskins@statistics.uchicago.edu & Yuehaw Khoo, Department of Statistics (CAMI), ykhoo@galton.uchicago.edu
CAM Colloquium URL: https://cam.uchicago.edu/events/cam-colloquium/

If you wish to subscribe to our email list, please visit the following website:
https://lists.uchicago.edu/web/subscribe/cam_colloquium/.