

GEOMETRIC DATA PROCESSING GROUP



The Geometric Data Processing Group studies geometric problems in computer graphics, computer vision, machine learning, and other disciplines.



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Research Vision

Our mission is to widen the scope of geometric data processing to encapsulate the theory, algorithms, and applications for shape processing applied to abstract datasets and 3D surfaces alike.

Areas of Research

- Optimal transport
- 3D shape analysis
- 3D computer vision
- Large-scale optimization
- Uncertainty and probability
- Geometry processing
- Learning from geometric data
- Computer graphics

Research Activities

- Optimal transport for statistics and machine learning
- Geometry and topology for scientific computing and shape analysis
- Sensible deep learning for 3D data



In the News

- The group developed an algorithm that relies on optimal transport to <u>blend musical notes seamlessly</u>.
- New work in <u>2D and 3D meshing</u> improves physical simulations for computer-aided design.
- A new technique presented at NeurIPS cuts through massive amounts of internet text.

Industry Applications

- Health care
- Entertainment
- Big data
- Manufacturing
- Transportation
- Computer graphics
- Computer vision
- Computer-aided design
- Scientific computing

"Geometric reasoning is a versatile component of the computational toolbox, which we can apply to a huge variety of applications. The same intuition we apply to problems in 3D modeling can help us think about high-dimensional datasets, bringing mutual benefit to both."

Prof. Justin Solomon

Group Members

Principal Investigator Prof. Justin Solomon

Postdoctoral Associates

Dr. Aude Genevay Dr. Xiangru Huang Dr. Tal Shnitzer Dr. Oded Stein

PhD Students

Mazdak Abulnaga (co-advised with Polina Golland) Rickard Brüel Gabrielsson Lingxiao Li David Palmer Chris Scarvelis Dmitriy Smirnov Yu Wang Yue Wang Paul Zhang

MEng Students Edward Goul

