

Geometry and Topology Games... under the hood

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This pair of talks will begin with a brief overview of the Geometry Games software and the mathematical ideas they present, followed by some even briefer comments on designing math software for the general public. The bulk of the talks will then consist of the following three case studies that illustrate how the Geometry Games apply classical mathematics to create fast, effective software:

- How KaleidoPaint draws lots of images very quickly
(an application of undergraduate-level group theory)
- How Curved Spaces draws pixel-perfect images on the GPU
(an application of projective geometry)
- How to represent an object's placement and velocity in S^2 , E^2 and H^2
(an alternative to matrices and quaternions)