Tangent vector field processing on discrete surfaces poses many challenges, one of the first being the choice of representation. The popular choice of piecewise-constant vector fields per face leads to very simple expressions and algorithms, at the price of lower accuracy and difficulties in defining derivatives and smoothness energies. Piecewise-linear vector fields on vertices lead to better results, but also to a much higher complexity due to the use of curved triangles, making important differential operators challenging to compute. We propose a very simple, yet powerful, edge-based discrete representation of tangent vector fields, which can be trivially generalized to represent N-RoSy fields. Our representation is as simple as the face-based representation (allowing to easily compute operators such as divergence and curl), yet has accuracy comparable to vertex-based representations. We demonstrate applications of this representation to tangent vector field design under a variety of constraints.

This talk summarizes the M.Sc. research of the speaker under the supervision of Prof. Miri Ben-Chen.

The lecture will be held on Sunday, 13.12.2015, at 13:30, Taub 337