General overview of the tracing process

Tasks

- Wrapping textures (UV)
- Normals
- Generate strokes

Inputs

- 3D model (e.g. .obj)
- Design:
  ‣ 1st: vector pattern textures with color labels (e.g. SVG)
  ‣ 2nd: colored pattern textures
  ‣ 3rd: raster image + vectorization
  ‣ 4th: front/side images

Outputs

- List of strokes:
  ‣ 3D positions (start + end)
  ‣ normal vector
  ‣ color ID

Steps

1. (Texture Projection)

2. Color separation
   - 1st: multiple input textures, by color
   - later: color isolation and approximation

3. Topological separation
   - Color islands

4. Contour & filling
   - Contour segmentation → longer strokes
   - Filling segmentation → many little parallel strokes (TBD: what kind of pattern, topological optimization)
   - Position interpolation to compute 3D positions of texture points
   - Path segmentation according to normals (e.g. delta threshold)

5. Ordering
   - Sort little paths to minimize distance between consecutive end- and start-points, as well as normal delta (graph)

6. Output
   - Aggregate coordinates with color and normals
   - Format data for next step

Questions

- one long stroke or multiple little strokes ? what is best and why ?
- should we take into consideration the size of the pen tip, especially for filling ?
- what should WE optimize ?

- what kind of filling patterns ? should they be optimized relative to the local topology ? how ?