Deep Sketch Vectorization via Implicit Surface Extraction

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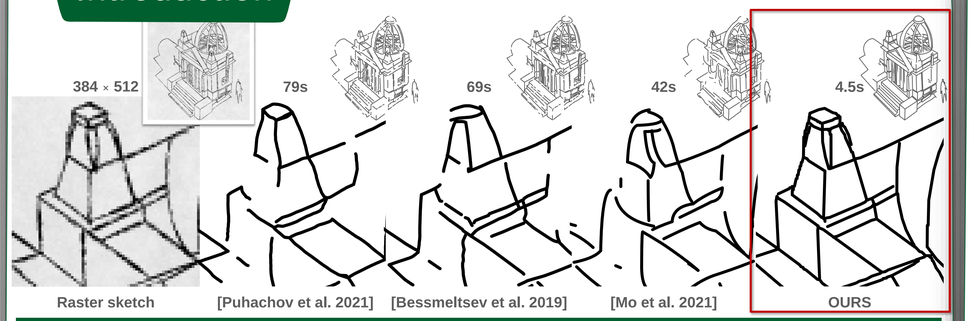
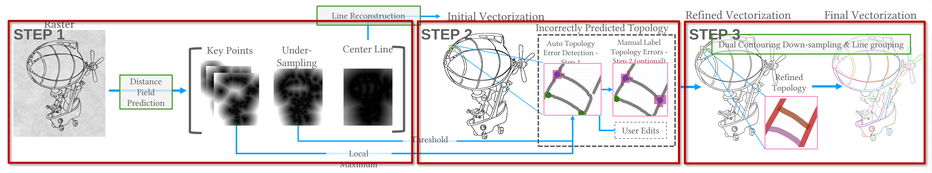
Introduction

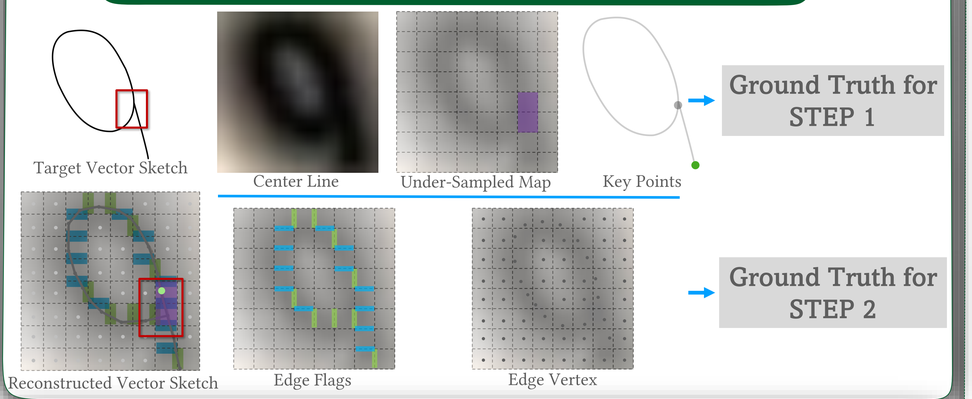


Vectorizing raster sketch with HIGH FIDELIDTY and FAST SPEED has always been a challenging problem

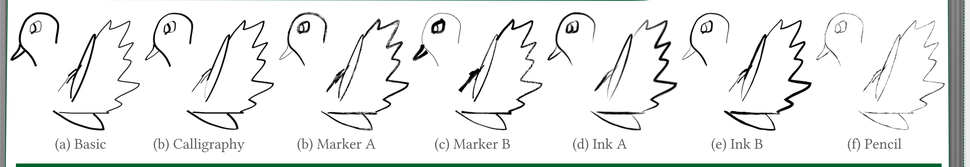


Our new sketch vectorization method formulates it as IMPLICIT SURFACE EXTRACTION problem by 3 STEPS

Dual Contouring with Under-Sampled Map

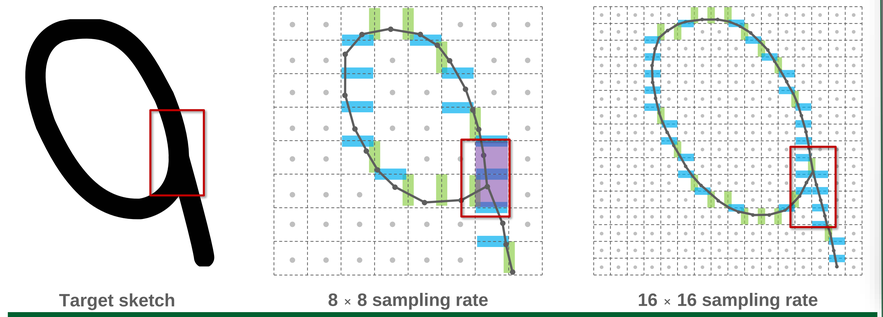


STEP1: Distance Field Prediction



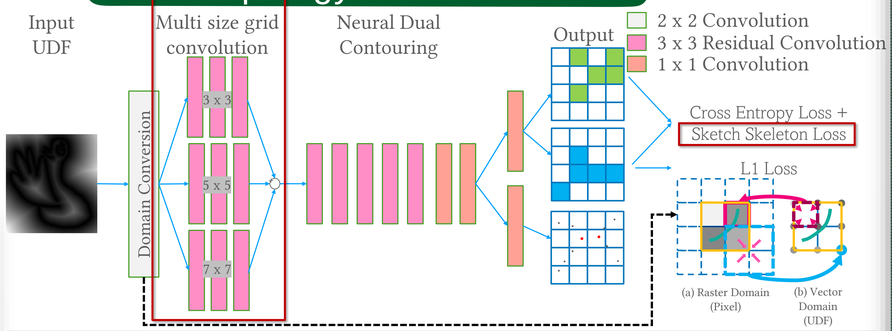
441K raster sketches from 63K vector sketches as training input, each vector sketch is rasterized with 7 brush styles

Sub-Pixel Sampling

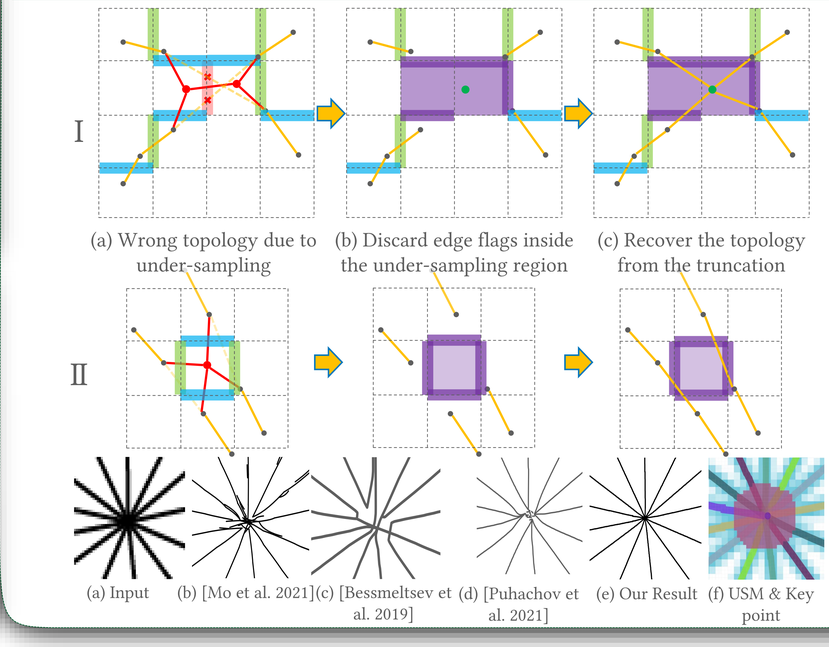


FEWER under-sampled regions, HIGHER precision

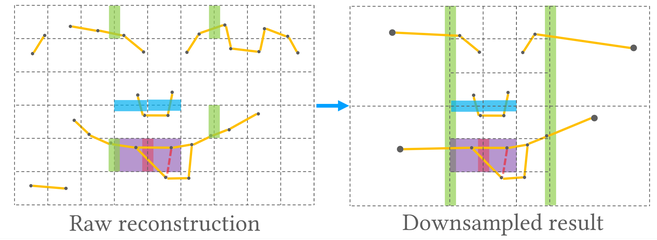
STEP2: Line Reconstruction & Topology refinement



Based on [Chen, 2022, et al.] with SKETCH SKELETON LOSS and MULTI SIZE GRID CONV, etc.

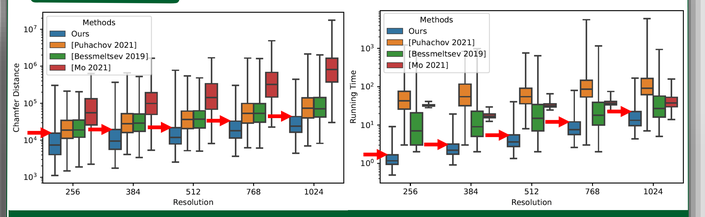


STEP3: Post Refinement

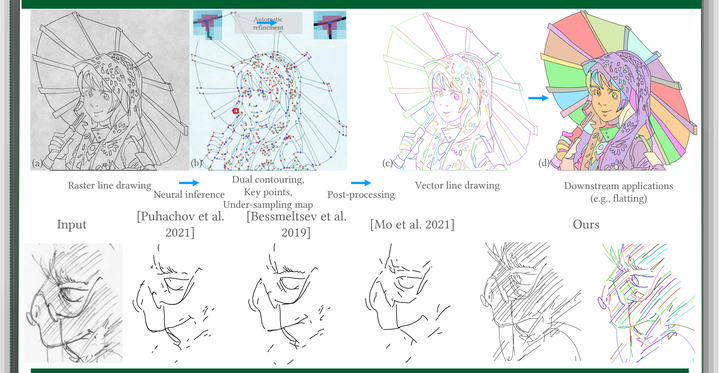


DUAL CONTOURING DOWNSAMPLING

Results

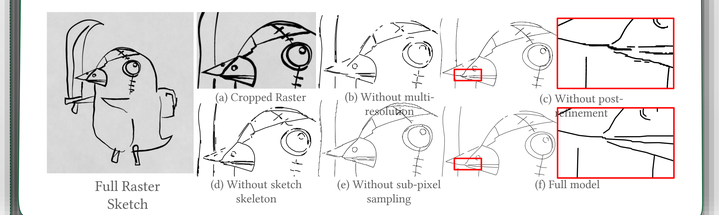


2x-10x better & faster, Y-axis LOG SCALED



Our method captures more details

Ablation Study



1. George Mason University, CraGL Computational Reality Creativity and Graphics Lab
2. Shenzhen University of Technology
3. Adobe
4. Waseda University