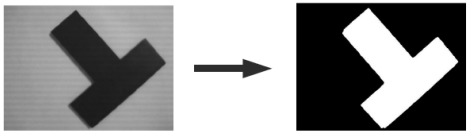
Preprocessing to ready for PDM

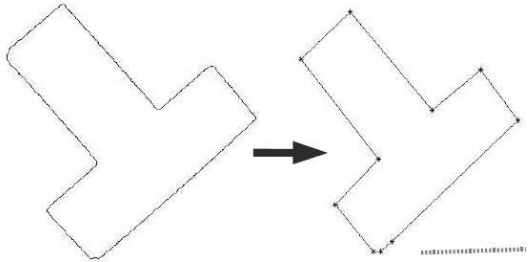
Robert B. Fisher
School of Informatics
University of Edinburgh

Algorithm Pre-processing

Load image, convert to binary (e.g. IVR)



Get boundary and find corners (system 1)



Problem: poor segmentation → varying numbers of corners

Exploiting Problem-Specific Knowledge

Exploit problem constraints: long lines, meet at given angles → delete short badly placed segments and extend to intersection

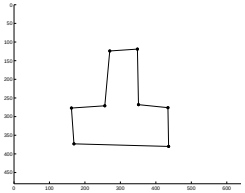
Exploit problem constraints: long lines → search for lines directly

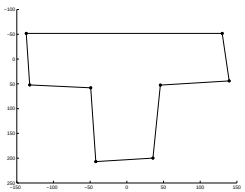
Rotating TEE to standard position

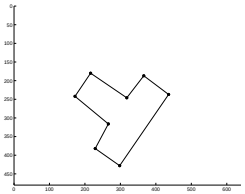
Assumes 8 lines in a rough TEE shape
Use heuristic algorithm (about 160 lines of code)

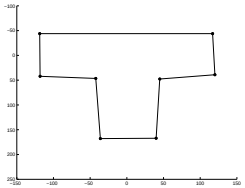
1. Sort 8 lines into 2 sets of 4 mutually nearly parallel lines (reject if not possible): find direction of one line, sort all others by whether angle with this line is $\leq \frac{\pi}{4}$ or not
2. Find which set is the head of TEE (reject if neither or both satisfy criteria). Also sort into positional order: if longest is sufficiently longer than the next and the 3 shortest are about the same length as the longest, the longest is the head of TEE
3. Estimate transformation of TEE to standard position with TEE head top parallel to column axis and center of TEE at origin. Apply transformation to TEE.

Example segmented boundary and standard alignment

1) 

aligned) 

2) 

aligned) 

What We Have Learned

1. PDM algorithm needs data in a standard configuration
2. Use heuristics derived from problem-specific knowledge