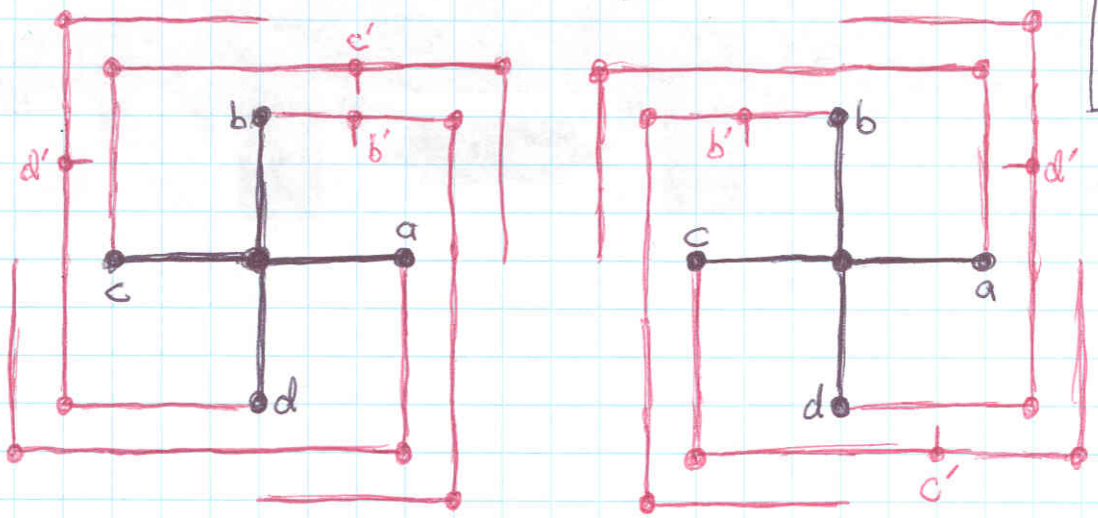
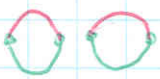
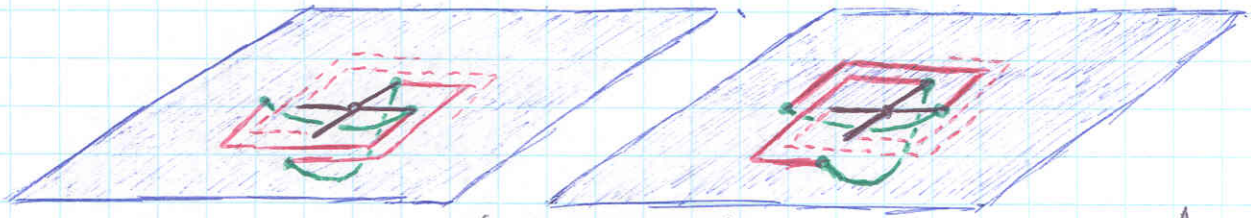
Flat-state disconnected partially rigid tree

6.885
L16.2
Nov. 8, 2004



- all four branches must "flip over" 180° to reach target
  ⇒ possible with self-intersection
- pins b', c' ⇒ target is not a rigid motion of source
- view plane abcd as stationary during motion
  (dihedral motions keep incident bars coplanar)
- four branches & two sides of plane
  ⇒ at least two branches must flip through the same side
- opposite branches, say a & c, can't use same side:
  - links parallel to axis ac of rotation intersect ... exactly
  - if a branch is slightly "shorter" than c branch
    then a branch properly intersects c's pin c'
  - similarly, make b branch slightly shorter than d.
- adjacent branches, say a & b, can't use same side:
  - topological argument
  - connect shallow rope from **a** to end of **a** branch
  - connect deeper rope from **b** to end of **b** branch
  - unlinked in source ⇒ linked in target





- ropes can stay as-is during motion above plane
  ⇒ a & b branches must cross