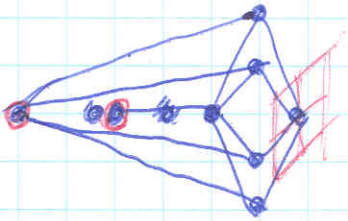
Project presentations

6.885
L24.1
Dec. 8, 2004

Tim Abbott & Reid Barton: Kempe universality

- new bracing of contraparallelogram to "fix" Kempe proof
- $O(n^2)$ bound on # bars
- believe $\Omega(n^2)$ lower bound because there are this many parameters in algebraic curve of deg. n
- $\Theta(\lg n)$ bound to multiply angle by n
- extension to d dimensions.
  - generalized Peaucellier linkage
  - rotate d coordinates of a point down to x_1, x_2 plane, use Kempe
  - $O(n^d)$ bars, conjectured optimal



- bigger sets:
  - polynomial inequality too
  - closed under intersection & union
  - ⇒ any compact semi-algebraic set (including piecewise polynomials!)
  - that's all you can get by a linkage
- OPEN: can everything be done by a continuous motion?