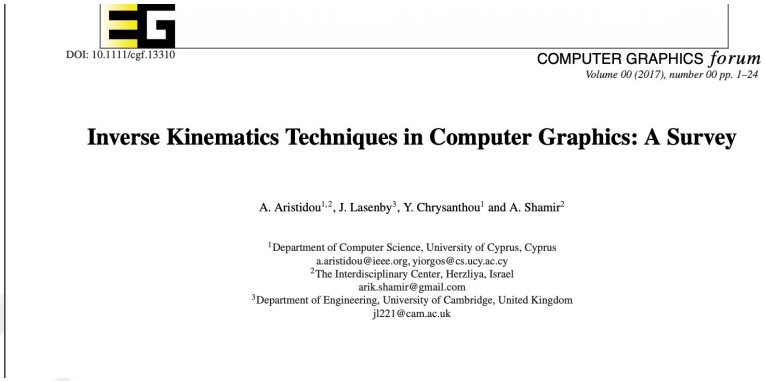
Animation for Computer Games
COMP 477/6311

Prof. Tiberiu Popa

Inverse Kinematics

Acknowledgments

- Material in this lecture based largely on:
- Aristidou, A., Lasenby, J., Chrysanthou, Y., & Shamir, A. (2018, September). Inverse kinematics techniques in computer graphics: A survey. In *Computer Graphics Forum* (Vol. 37, No. 6, pp. 35-58).
- http://www.andreasaristidou.com/publications/papers/IK_survey.pdf



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Inverse Kinematics Techniques in Computer Graphics: A Survey

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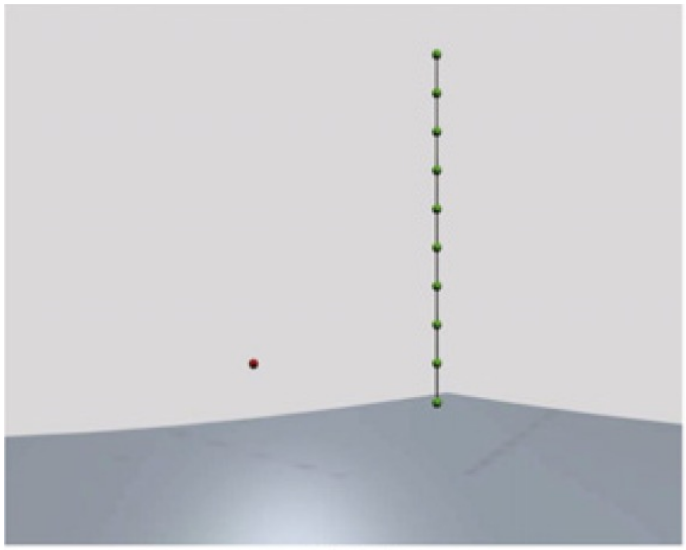
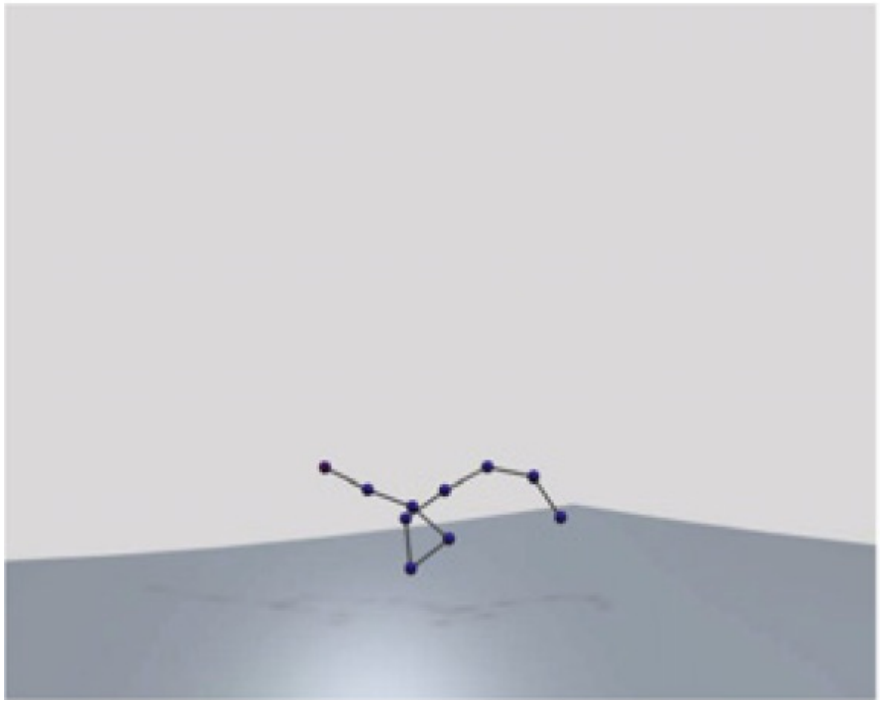
IK Methods Covered

- Heuristic Methods
  - CCD
  - FABRIK
- Jacobian/Newton methods
  - Numerical framework
  - Iterative simultaneous optimization of all angles
- Machine learning
  - Deep learning
- Other

A last look at CCD



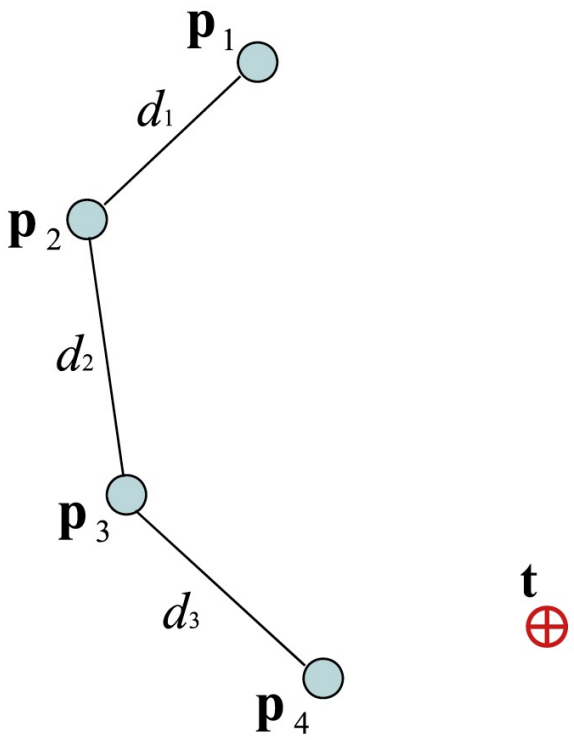


FABRIK

- Keep the same main idea, but add a twist to get a better solution

- Aristidou, A., & Lasenby, J. (2011). FABRIK: A fast, iterative solver for the Inverse Kinematics problem. *Graphical Models*, *73*(5), 243-260.

FABRIK



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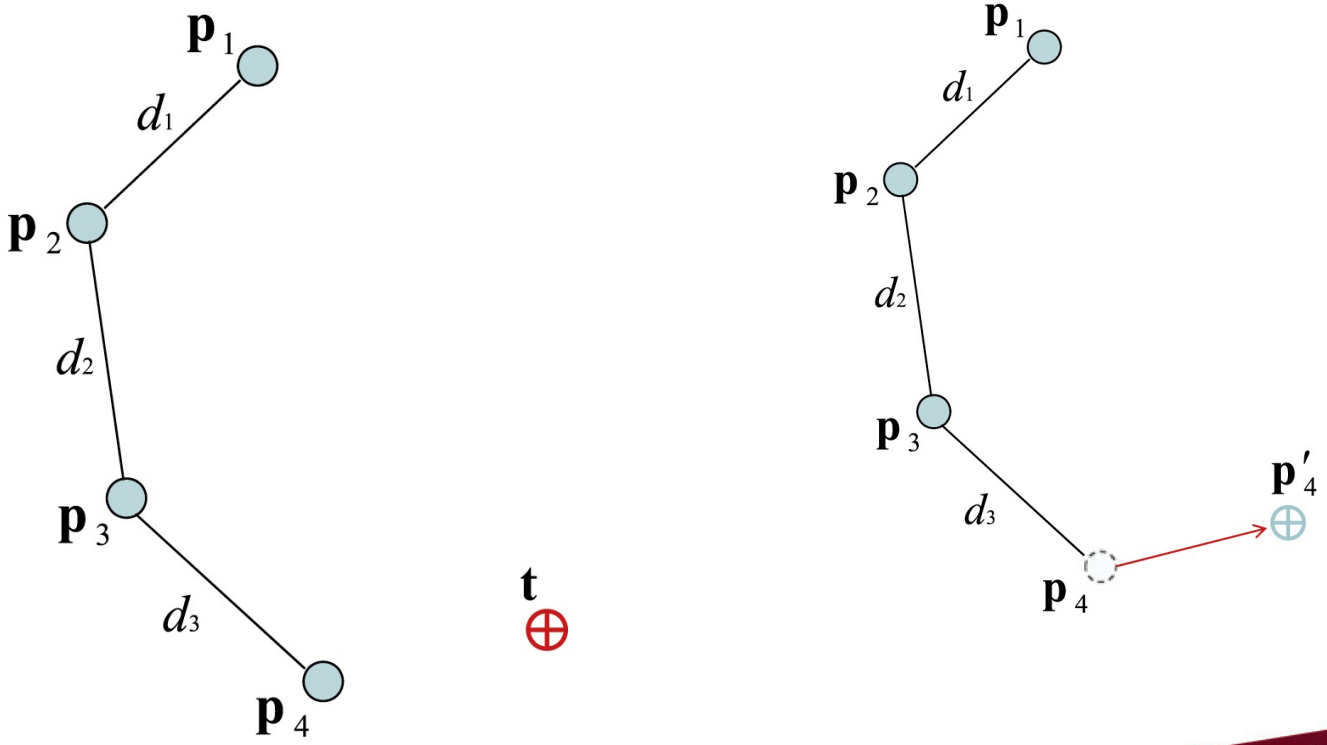

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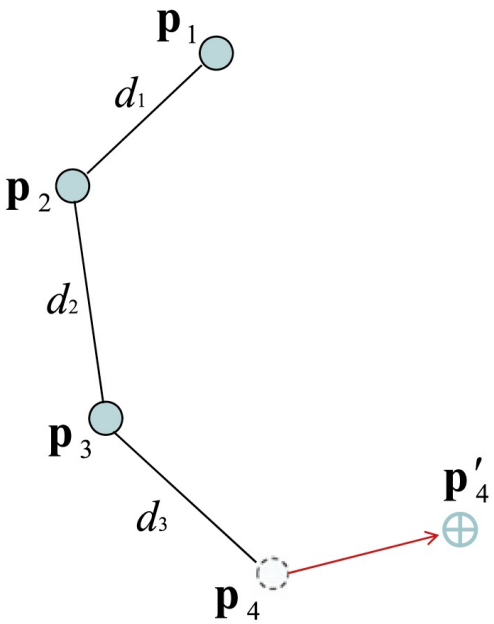
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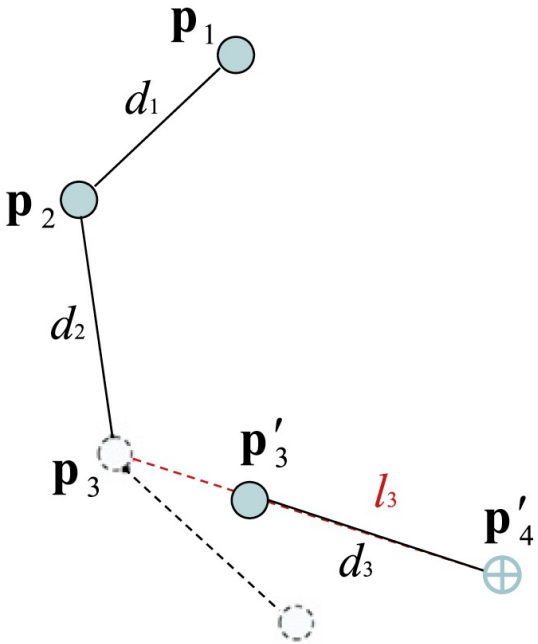
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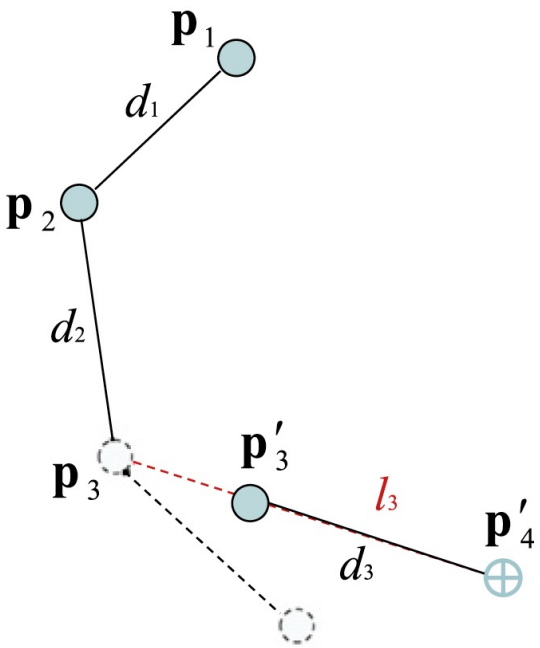
FABRIK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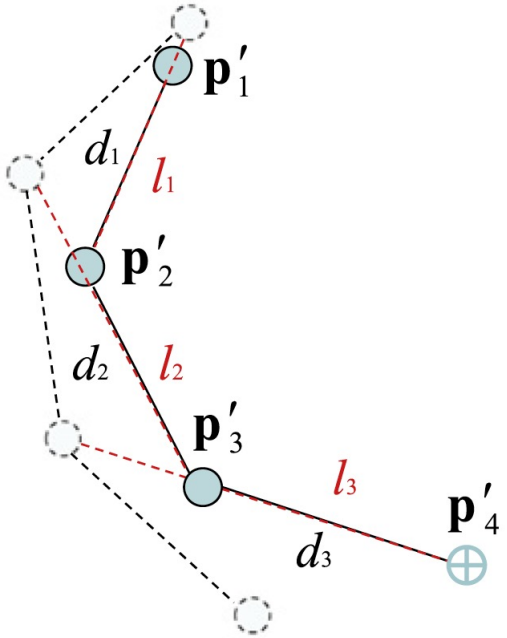
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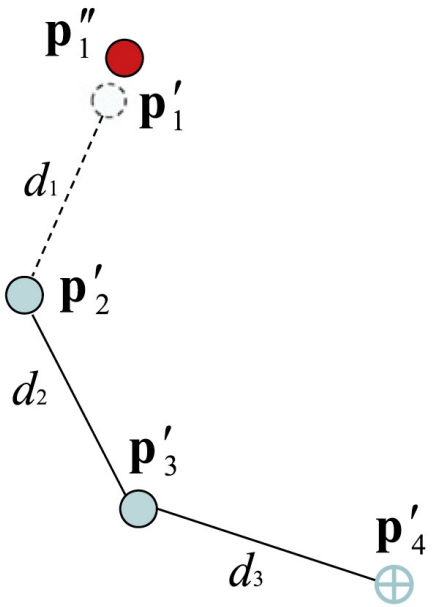
FABRIK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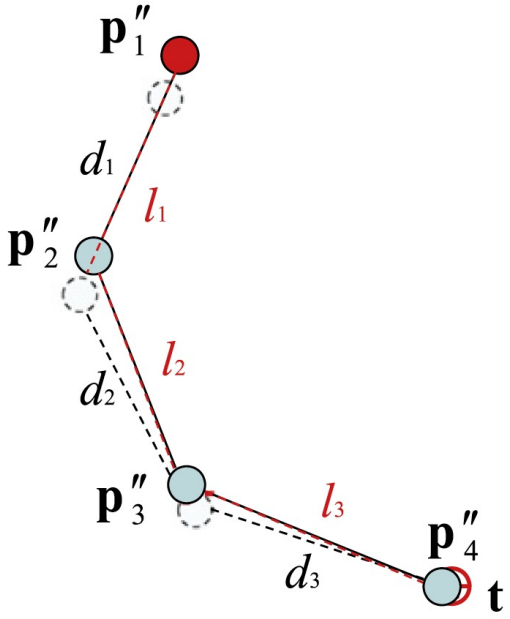
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FABRIK

- Keep the same main idea, but add a twist to converge faster