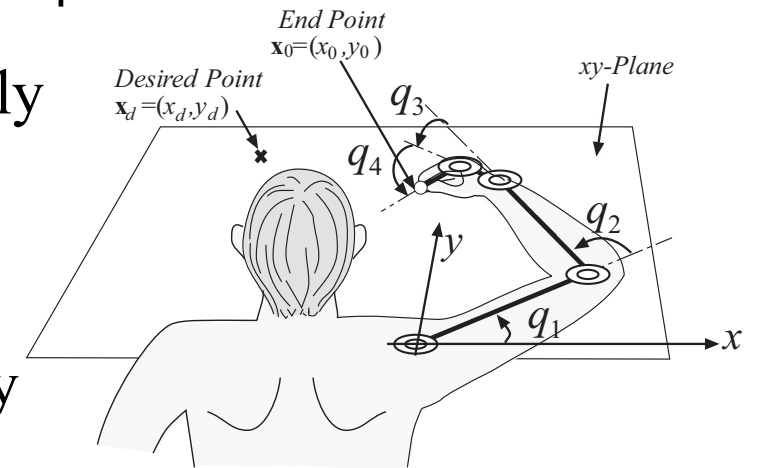


Physiologically Inspired Robot Control: A Challenge to Bernstein's Degrees-of-Freedom Problem

Suguru Arimoto, Masahiro Sekimoto, Hiroe Hashiguchi, and Ryuta Ozawa
Department of Robotics
Ritsumeikan University, Japan

- The suggested control signal(*) is extremely simple, which is composed of two terms
1) Damping and 2) Task-space position feedback
- Without calculation for optimization of any performance index, and
- Resolves ill-posedness of inverse kinematics in a natural way
- Damping factors and a single stiffness parameter should be selected synergistically



Multi-joint point-to-point movement with redundant DOFs.

$$(*) \quad \mathbf{u} = -\mathbf{C}\dot{\mathbf{q}} - k\mathbf{J}^T(\mathbf{q})(\mathbf{x} - \mathbf{x}_d)$$