2021 INTERNATIONAL WORKSHOP ON EMBODIED INTELLIGENCE

Break-out session 1: Beyond Soft Robotics, 25 March, 5pm - GMT

Rod Integration and Embodied Intelligence

Hiromi Mochiyama
University of Tsukuba
motiyama@iit.tsukuba.ac.jp
Real-time Shape Estimation

Reconstructing the statically balancing rod shape in real time based on the base wrench.

6-axes Force/Torque Sensor

Estimated Shape
Rod Integration from EI Viewpoint

1. Intelligence <-- Optimization under environmental constraints

\[ s^* = \arg \min_{s \in [0 \ L] \times \text{SE}(3)} P(s) \]

Elastic energy stored in the rod body

with \( \{s(0), s(L)\} = \{s_0, s_L\} \)

Rod boundary conditions

2. Role of “Body”

\[ s^* = \phi \left( \begin{bmatrix} f \\ m \end{bmatrix} \right) \]

Base wrench \( \in \mathcal{R}^6 \)

Rod Integration (Bijective)

Measurable through the body!

3. Challenges: Extend this viewpoint to more general contexts in terms of structure, dynamics, mechanism design and control.
Thank you!

motiyama@iit.tsukuba.ac.jp

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