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UNIVERSITY of PENNSYLVANIA

NSF Cognitive Neuroscience Workshop

Descartes déjà vu: Two Questions for Interdisciplinary Study in Cognitive Neuroscience

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HEX: DARPA/SPAWAR N66001-00-C-8026

FIBR: NSF EF/BIO 0425878

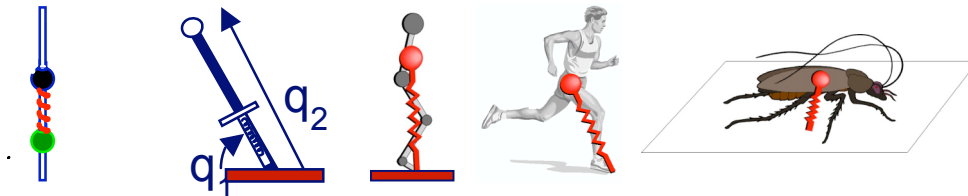
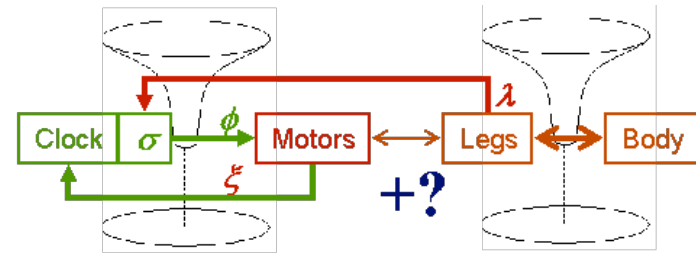


Why Does the Body Need a Brain?



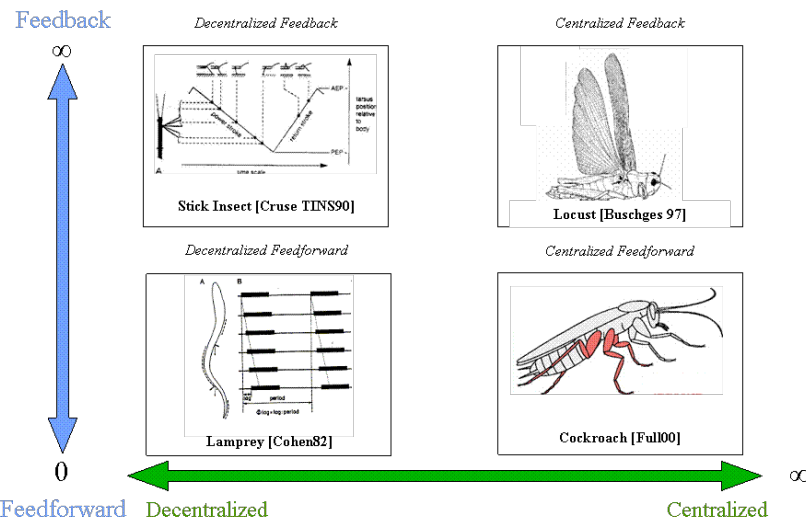
[Koditschek et al., IEEE-TRO'01]

- To Steer Clocks that Drive it?

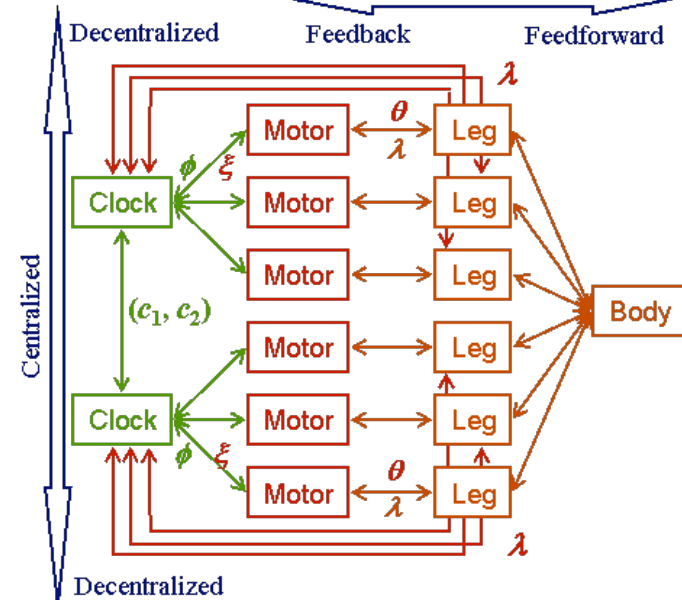


[Full & Koditschek J. Exp. Biol. '99]

Biology's Controller Design Space?



[Koditschek, Full & Buehler, Arth.Struct.Dev.'04]



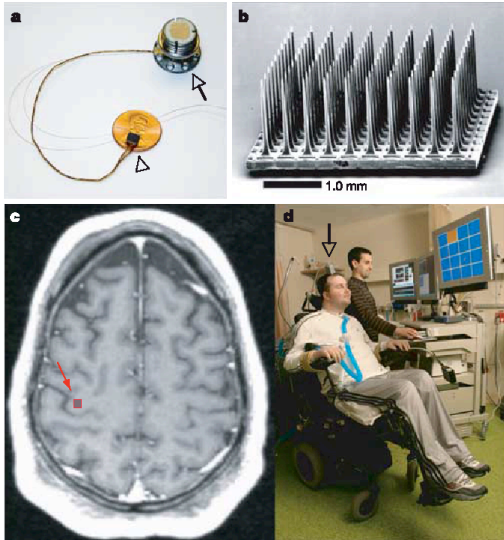
[Koditschek et al. ., IEEE RAM'04]

Why Does the Brain Need a Body?

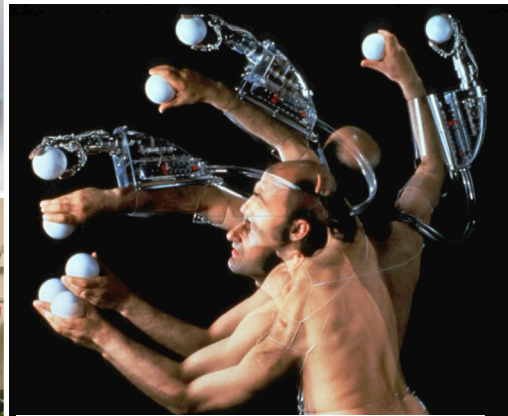
- Answers may be forthcoming from combined studies of ...

...the neuro-mechatronic reality of brain/body-machine interfaces

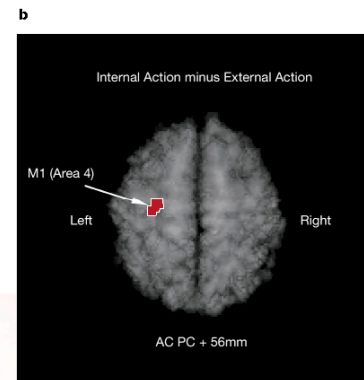
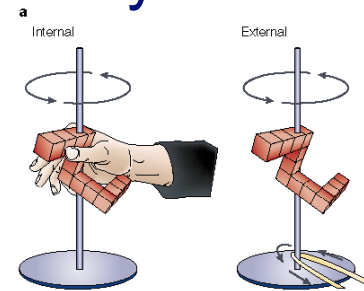
...the psycho-physiological reality of mental imagery



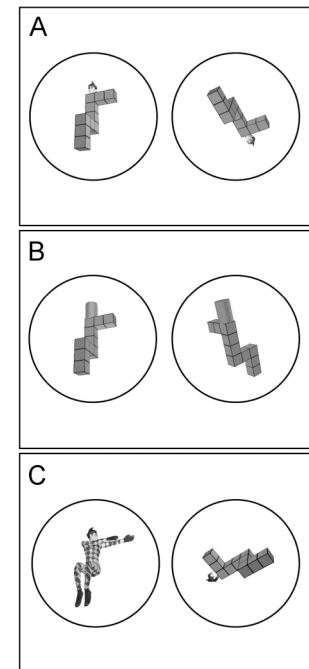
[Donoghue, et al. Nature 442 '06]



[<http://www.stelarc.va.com.au>]

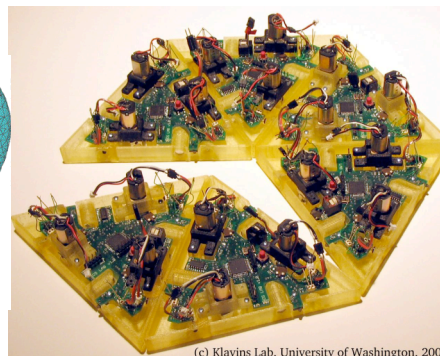
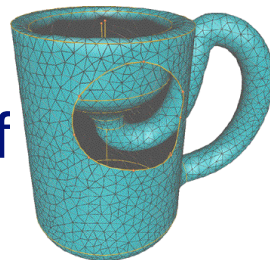


[Kosslyn, et al. Nat.Rev.Neuro. '01]



[Amorim et al. J Exp. Psych. 135 '06]

...the tools of topological robotics



(c) Klavins Lab, University of Washington, 2005

[Klavins, Ghrist & Lipsky IEEE-TAC'06]