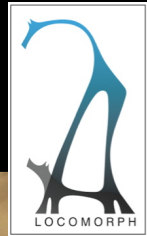


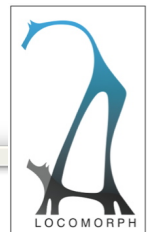
Locomorph Summer School, Odense Aug 2012 Tutorial "Modeling Locomotion"



André Seyfarth, Frank Peuker
Lauflabor Locomotion Lab • Institute of Sport Science
TU Darmstadt



AMAM2013.org



MARCH 11-14, 2013 | DARMSTADT | GERMANY
6th INTERNATIONAL SYMPOSIUM ON
ADAPTIVE MOTION OF ANIMALS AND MACHINES

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AUG 23, 2012

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Important dates

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Program

Oral presentations
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Hardware demonstration
Tutorials
Social event

Attending

Registration
Venue
Accommodation and Travel

Committees

Scientific Committee
Organization Committee



Conference venue Georg-Christoph-Lichtenberg-Haus (Photo: Katrin Binner)

Understanding adaptive motion in humans and animals can help us to improve the adaptive behavior of machines. On the other hand, experiments with technical devices that adapt to a changing environment can shed more light on the basic principles of biological systems. We believe that such a bidirectional approach is essential to incorporate biological "intelligence" in machines. The AMAM 2013 encourages researchers from different fields to interact and exchange ideas in this interdisciplinary field. For a list of the preceding symposia, please visit the [platform of AMAM conferences](#).

PARTNER EVENT

ROBOTS ON TOUR

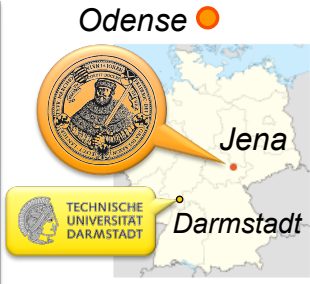
While planning your trip to Darmstadt you could also consider visiting the exhibition "Robots on Tour 2013", which will take place in Zurich, Switzerland on March 9th 2013.

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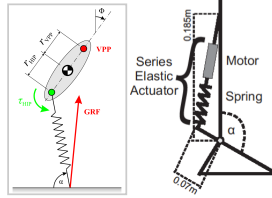


Lauflabor Locomotion Lab (2003-2012)



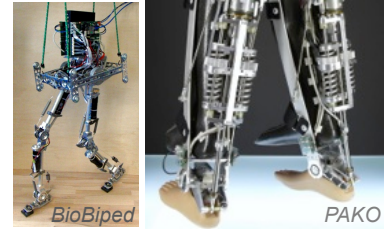
Experiments

- Humans
- Animals



Models

- Conceptual and
- Complex Models

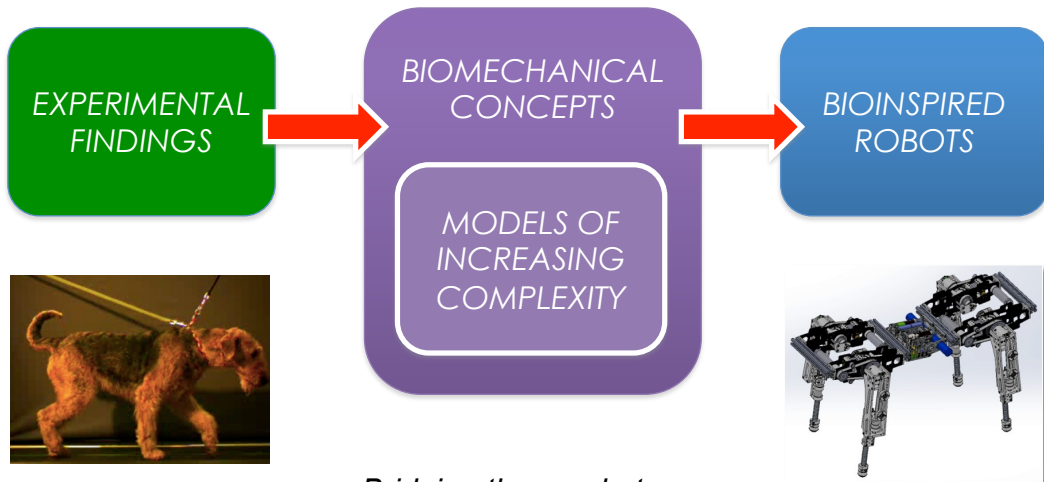


Robots

- Bipedes
- Prostheses

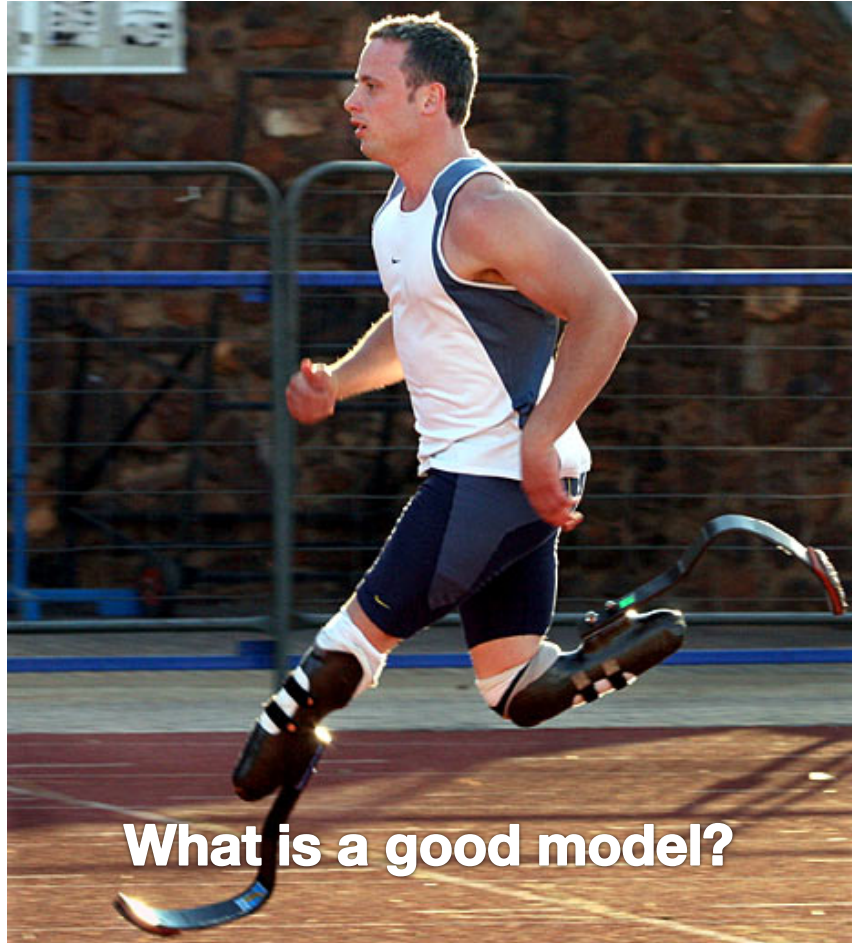


Modeling within the Locomorph project

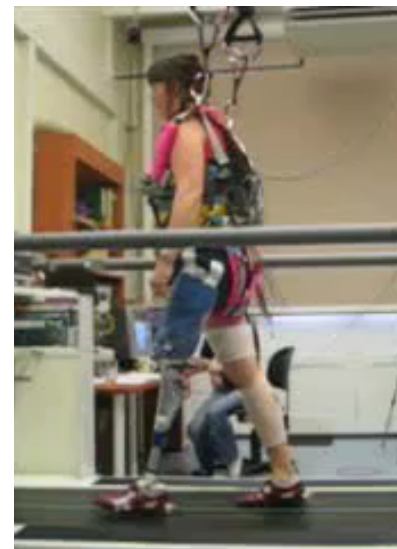


*Bridging the gap between
conceptual models and reality*





What happens, if ...



Martin Groß

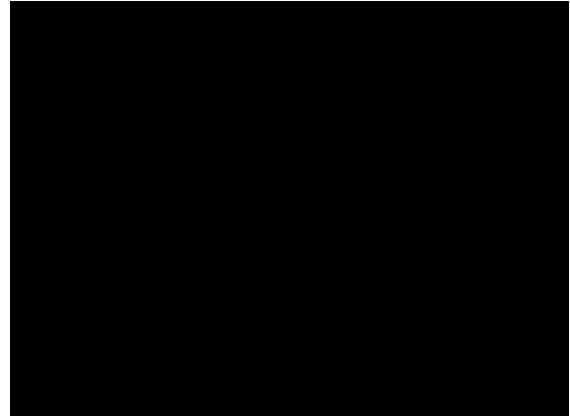
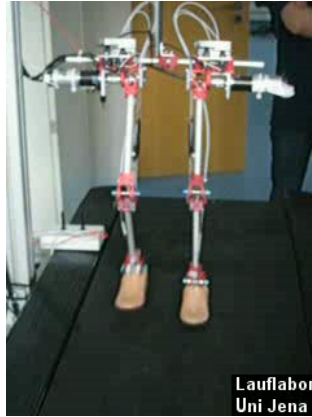


Christine Gratz

Forward Dynamic Models



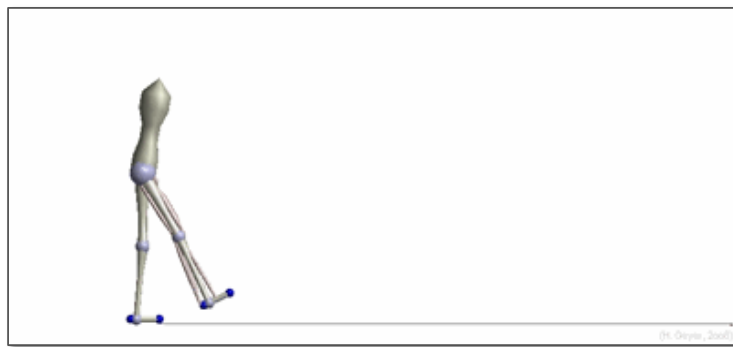
JenaWalker 2 (2005)



OpenSim: Samuel Hamner (2010)



Fumiya Iida



Reflex-driven biped

Hartmut Geyer (WCB, 2006)



Complexity of Models

Detailed Models (Neuromechanical Models)

Neuronal Control

Muscles / Sensors

Segment Mechanics

Contact Mechanics



Complexity of Models

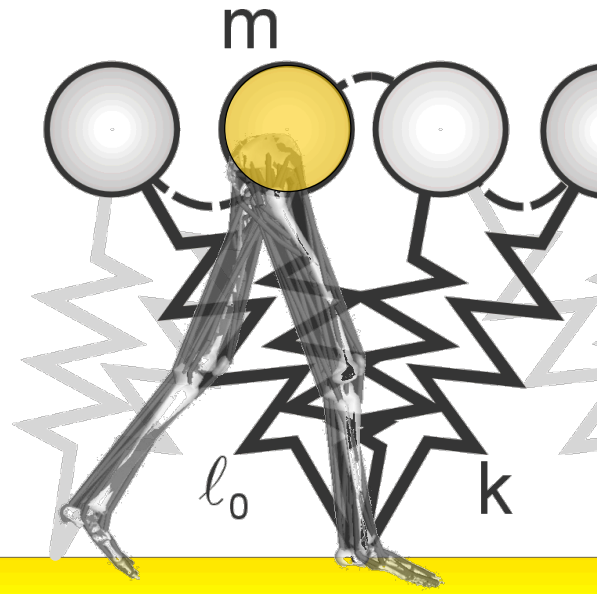
Detailed Models (Neuromechanical Models)

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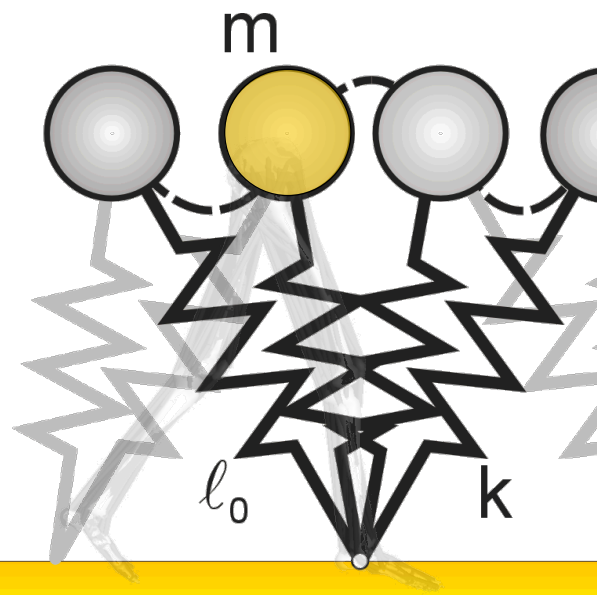
Complexity of Models

Simplistic Models (Template Models)

COM Dynamics

Simplified Geometry

Simplified Force Laws



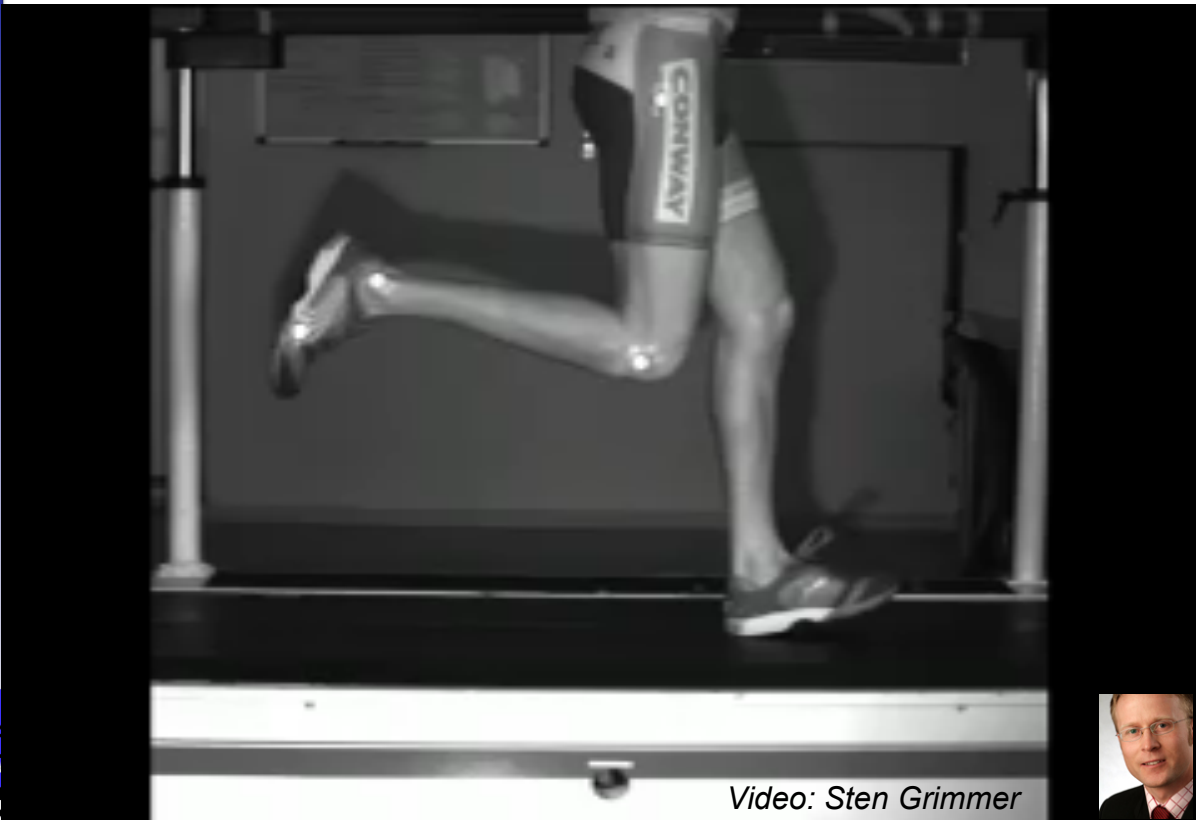
What makes walking and running easy?



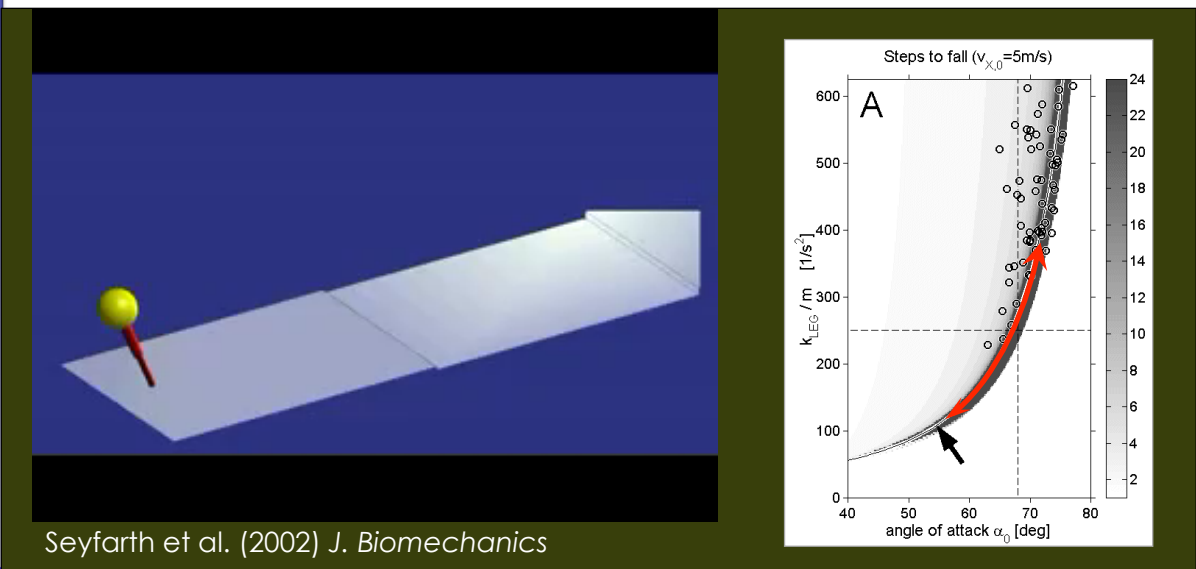
Self-stability



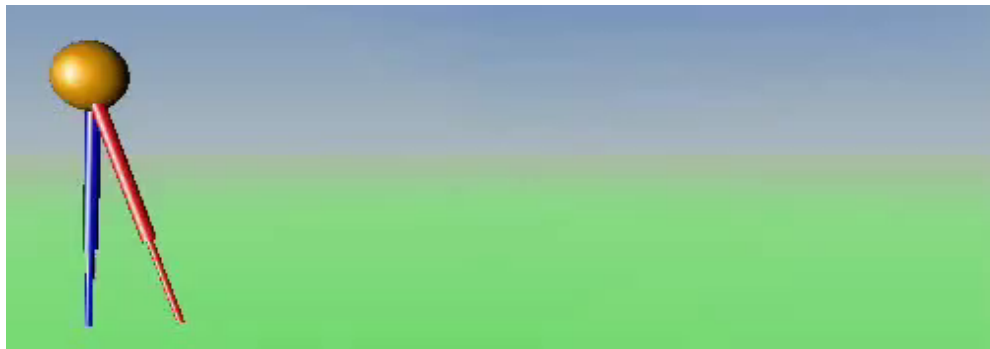
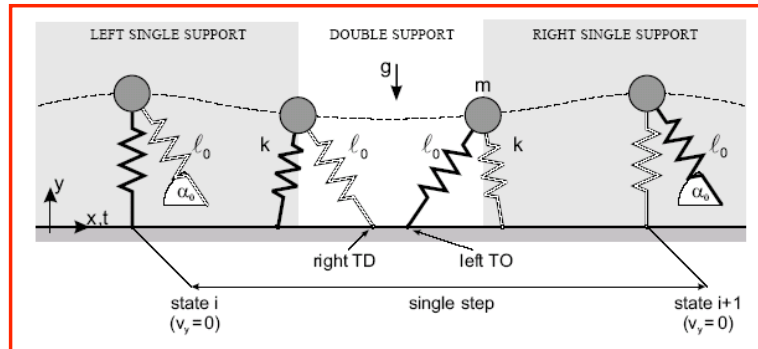
Selfstability in Running ?



Running with compliant legs



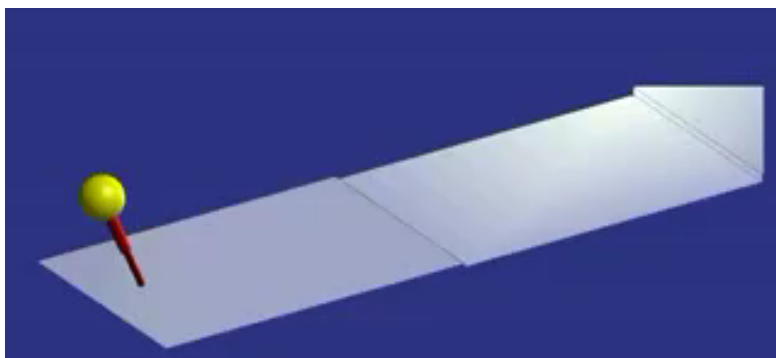
Spring-Mass Model for Walking & Running



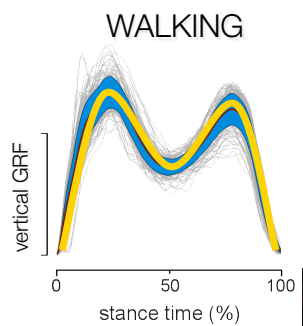
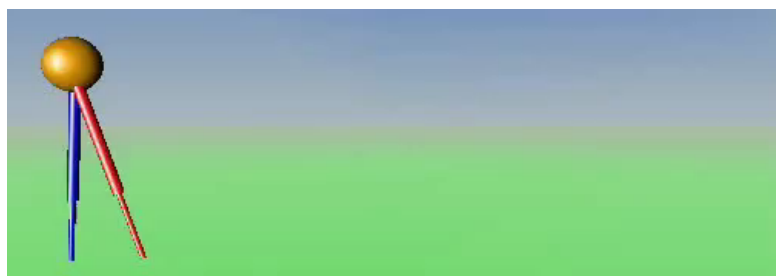
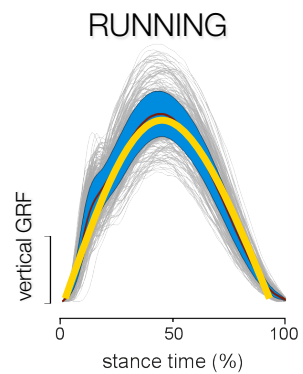
Geyer et al. (2006) Proc Roy Soc Lond B



Running and walking with compliant legs



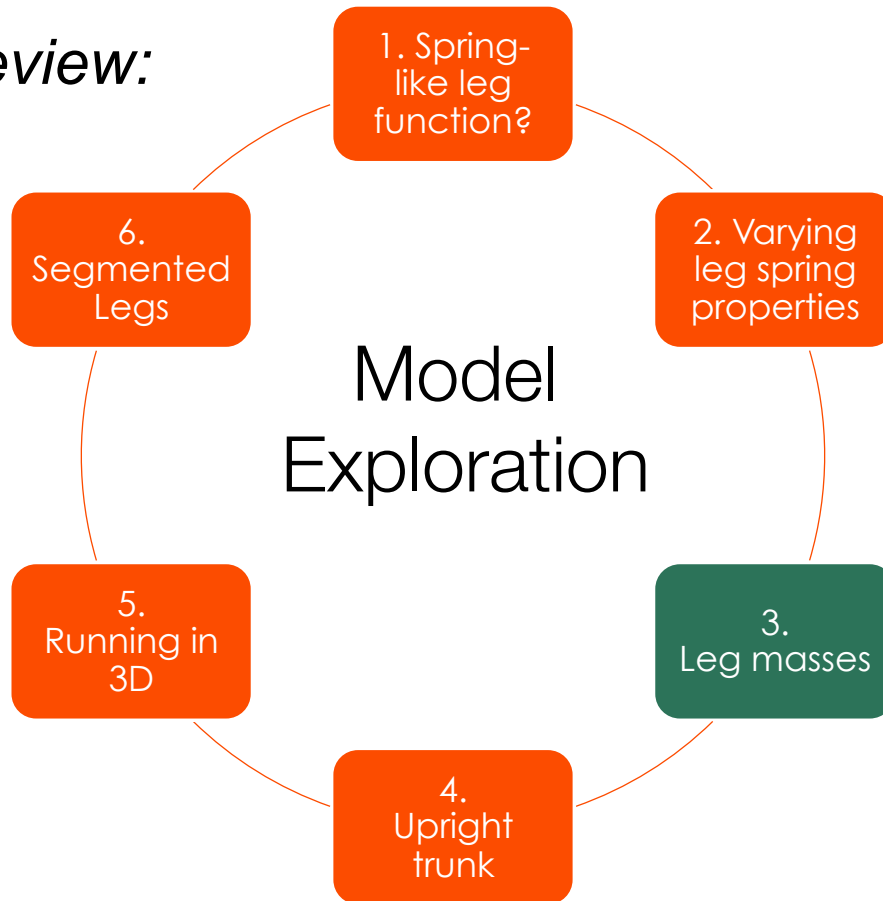
Seyfarth et al. (2002) J. Biomechanics



Geyer et al. (2006) Proc Roy Soc Lond B



Preview:



Frank: Tutorial

Build your
own SLIP model
in MATLAB