

# Kod\*lab

## Design of a Variably Compliant Leg Using Shape Deposition Manufacturing

Viktor Orekhov

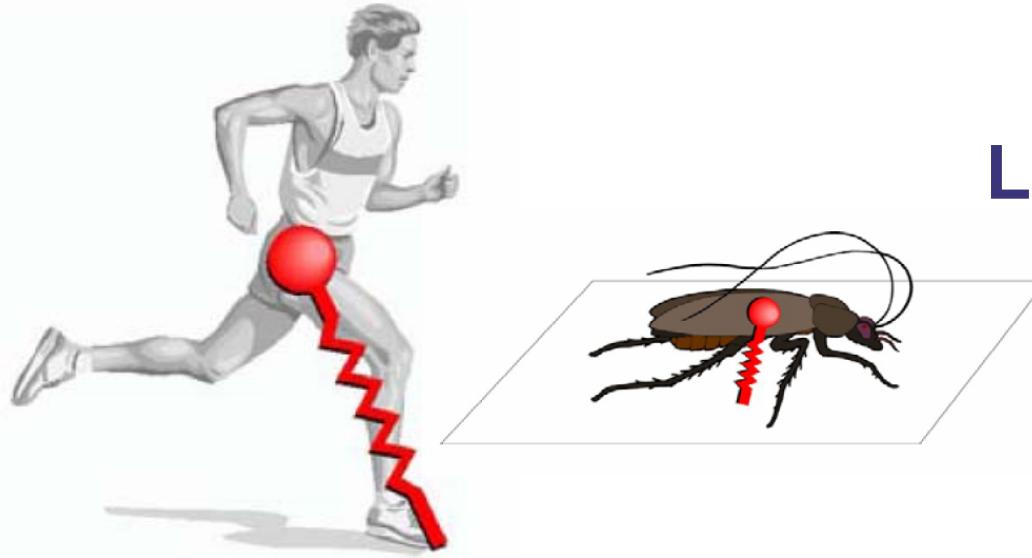
Tennessee Tech University

Cookeville, TN

SUNFEST 2007  
University of Pennsylvania  
August 10, 2007

# Compliance

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## Lessons from Nature

Passive Leg Control

Variable Stiffness

Energetics

Stability

Robustness

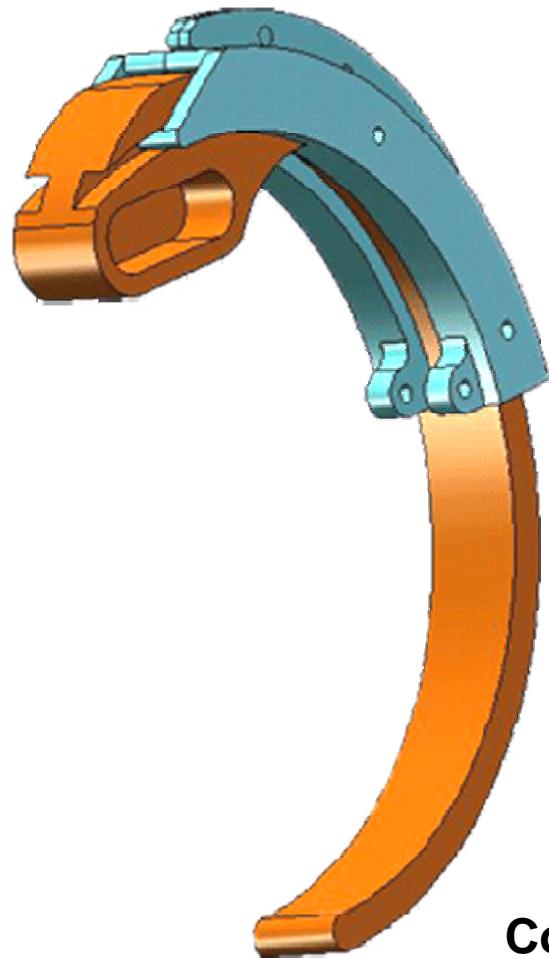


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# Design Challenge

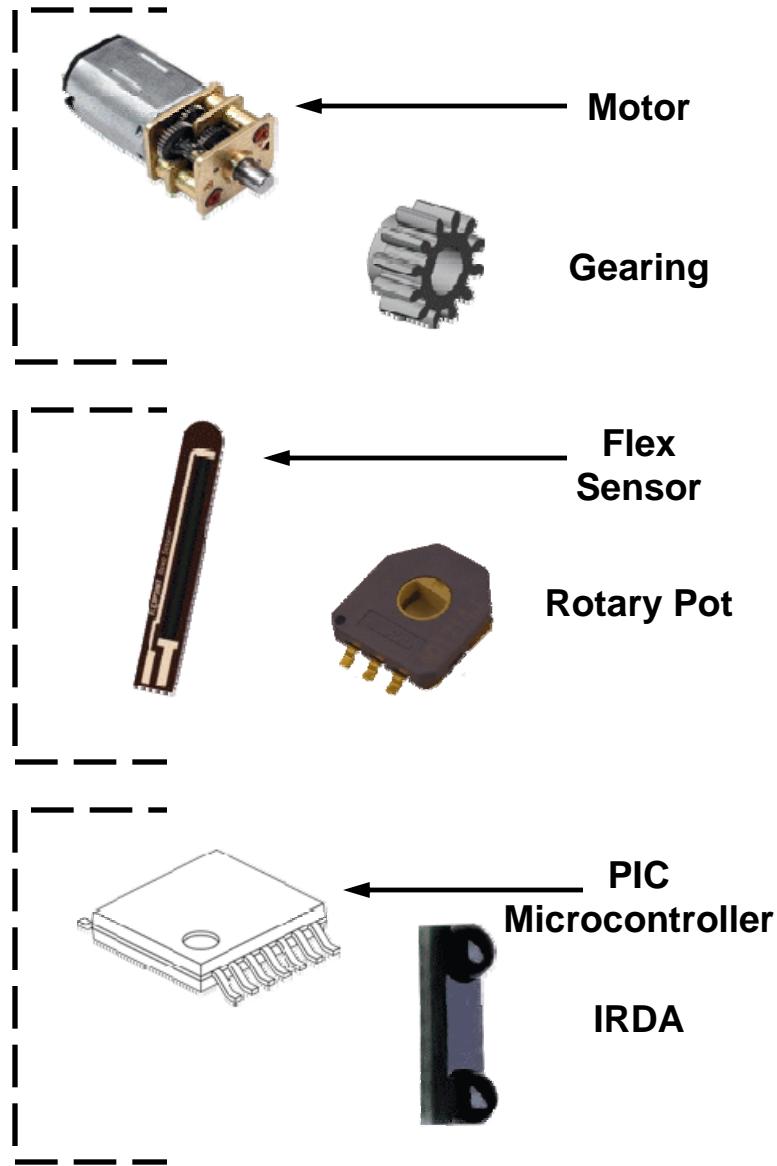
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Position  
Control

Sensors

Control and  
Communication



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# Shape Deposition Manufacturing

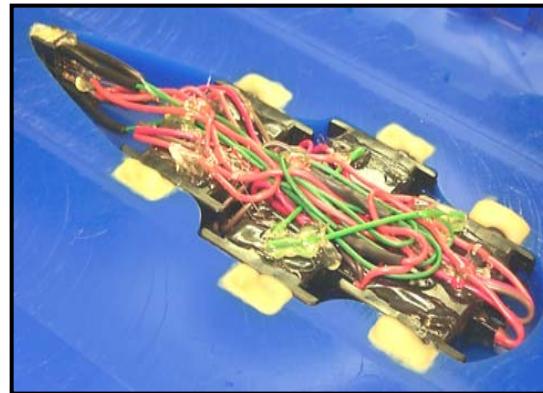
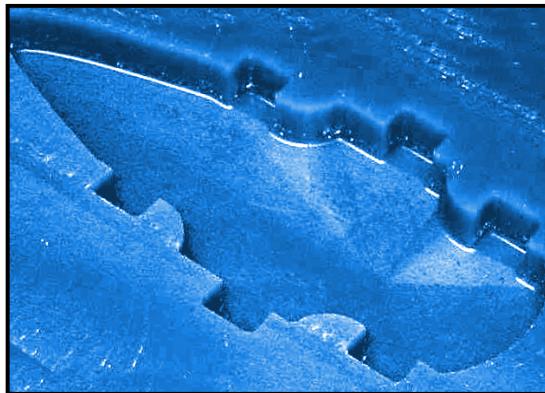
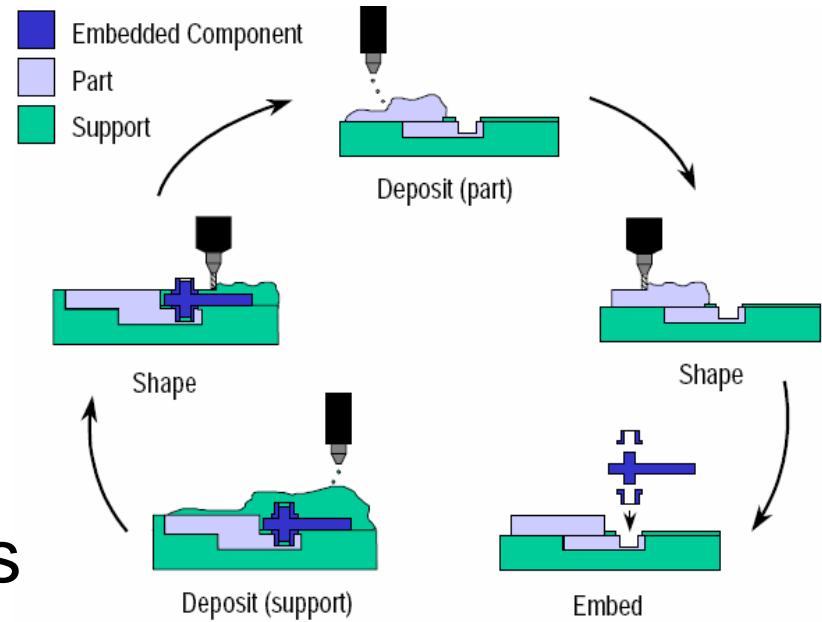
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## Layered Prototyping Technique

Complex Designs

Multiple Materials

Embedded components



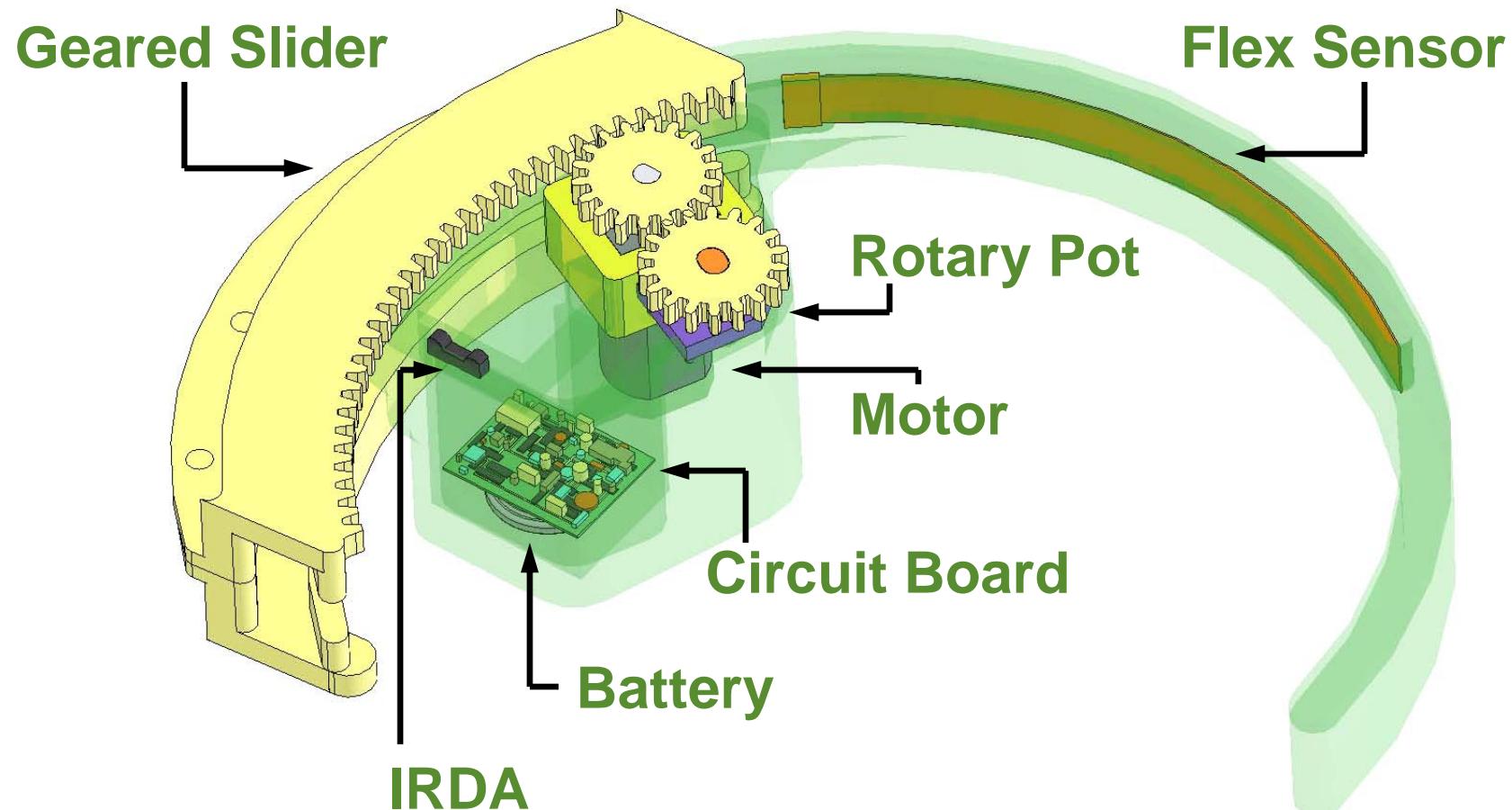
(Cham 1999)



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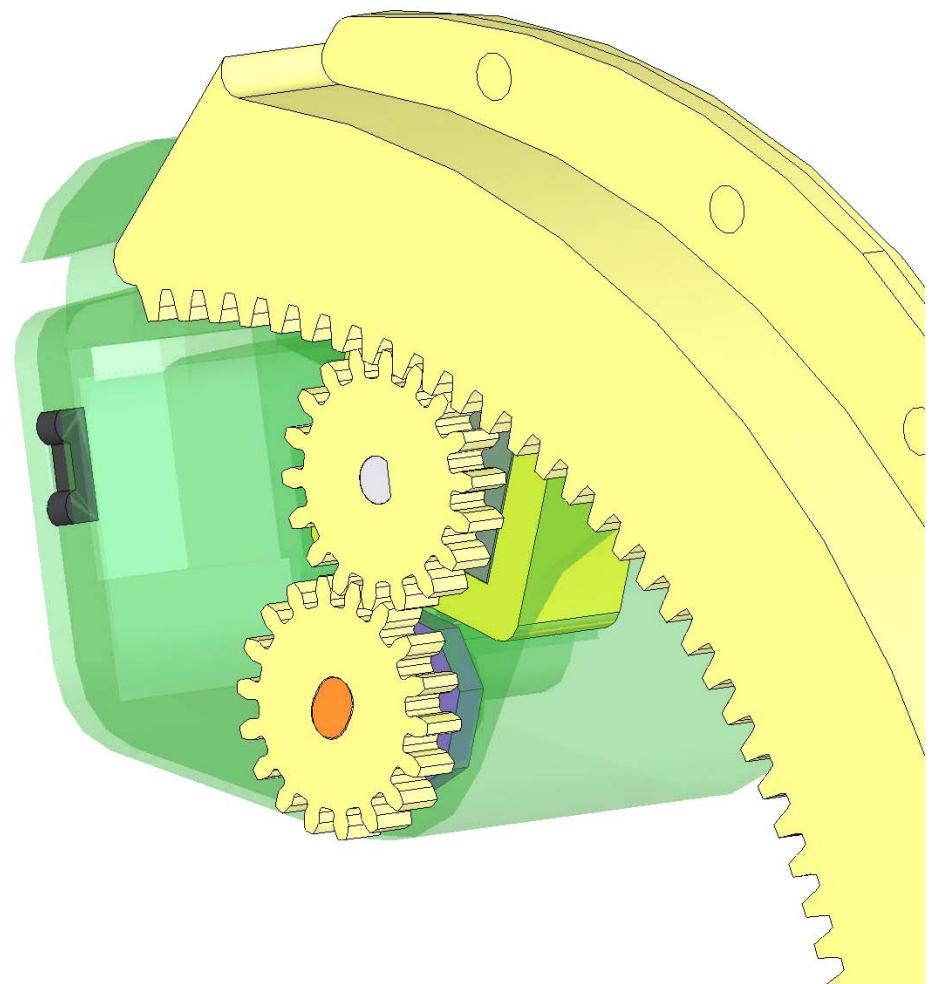
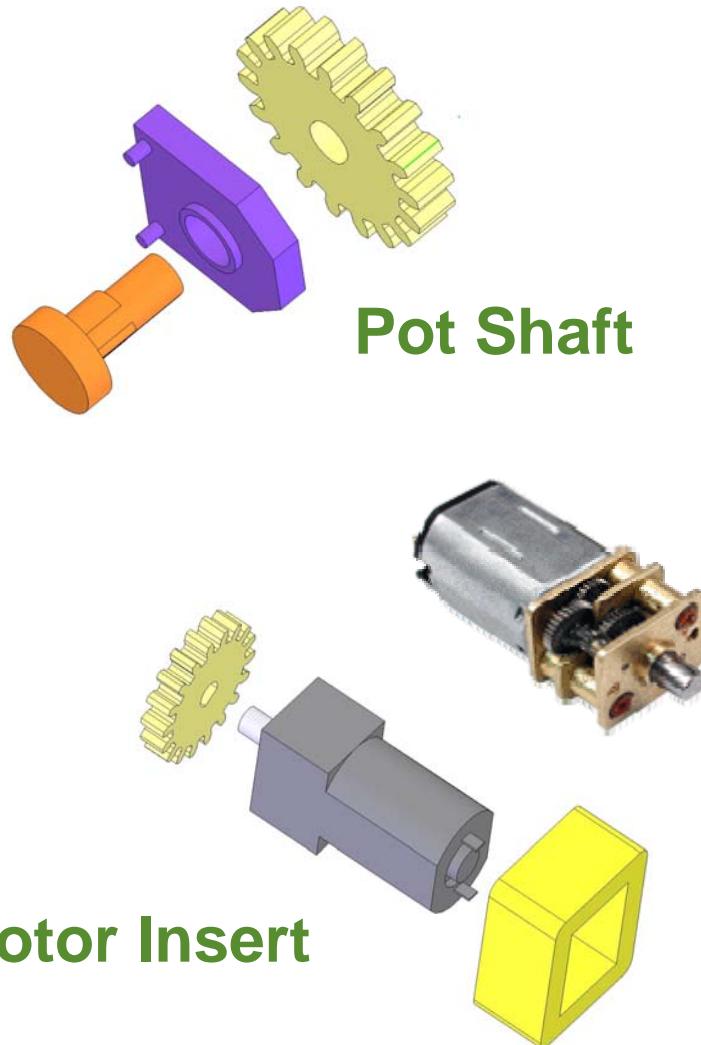
## Leg Design

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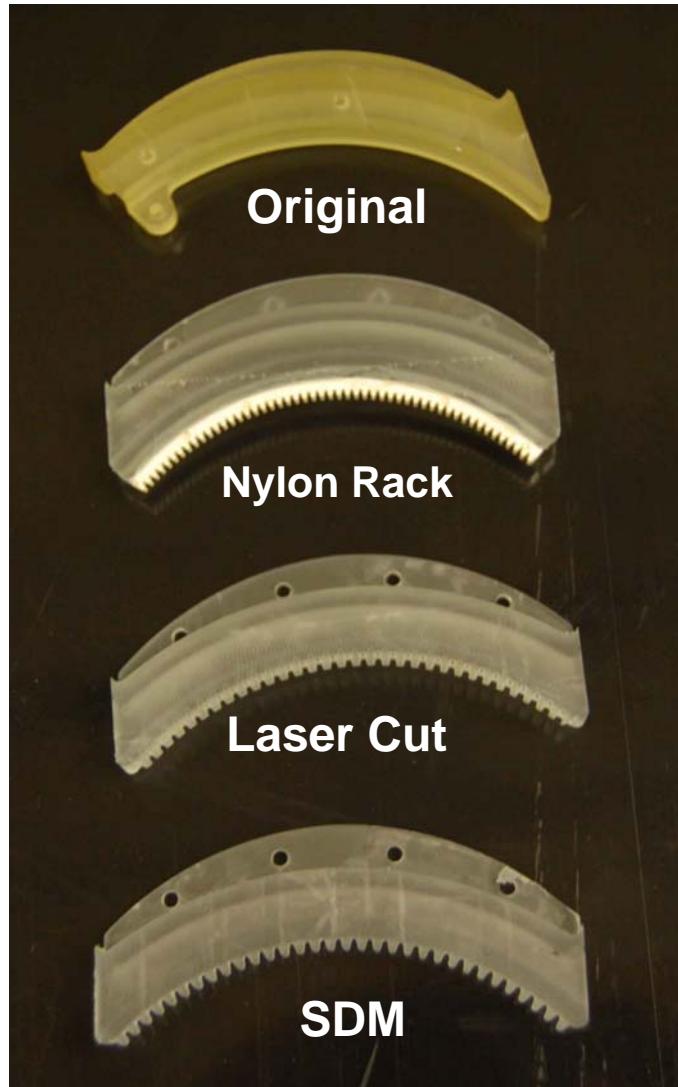
# Slider Actuation

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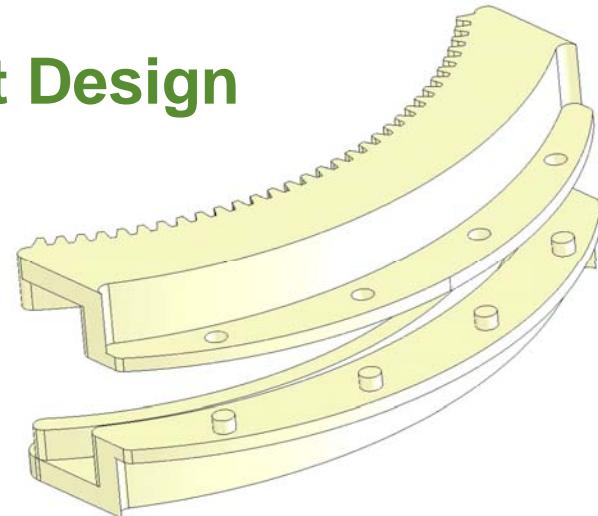


# Sliders

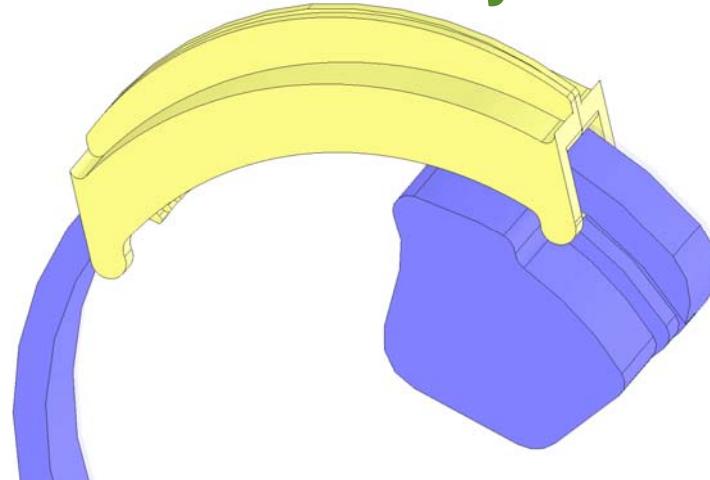
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Press Fit Design

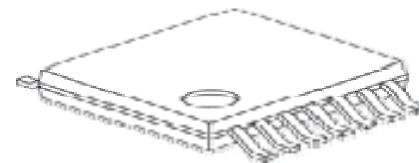
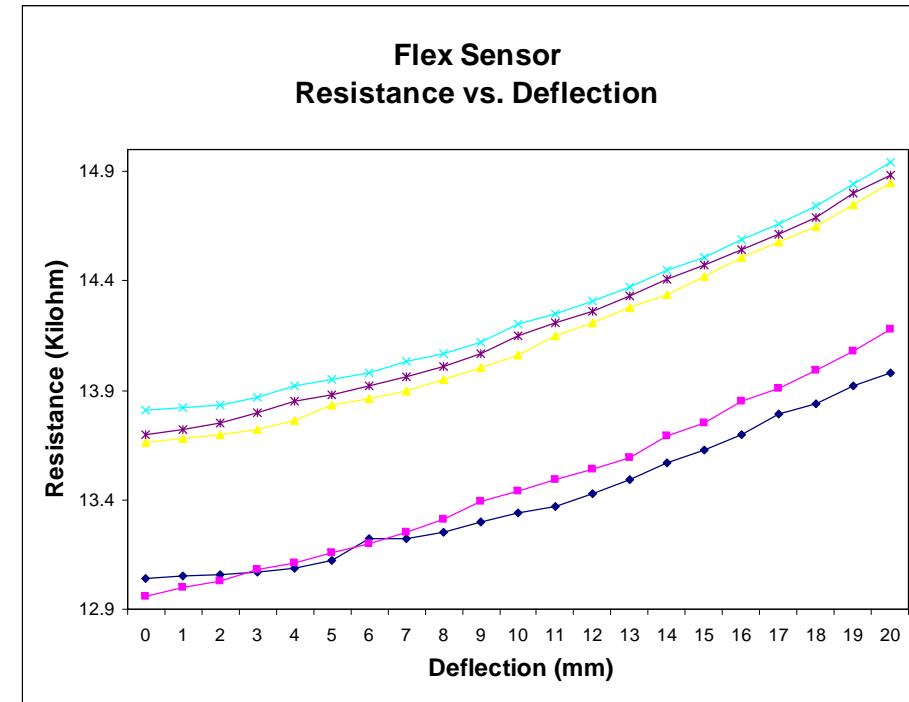
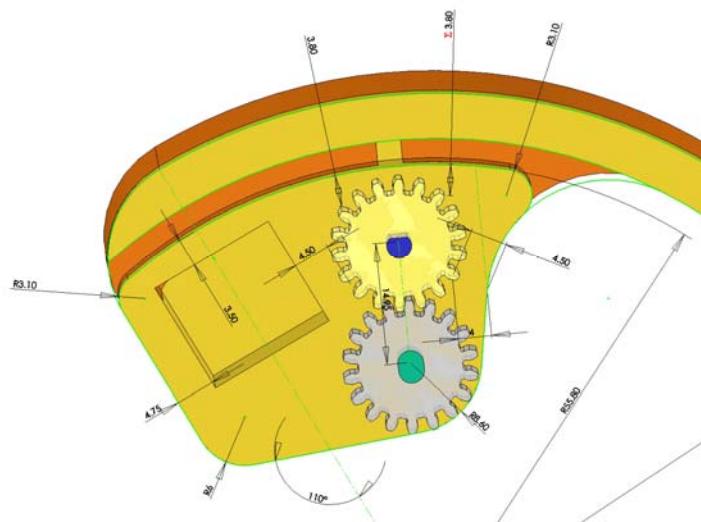
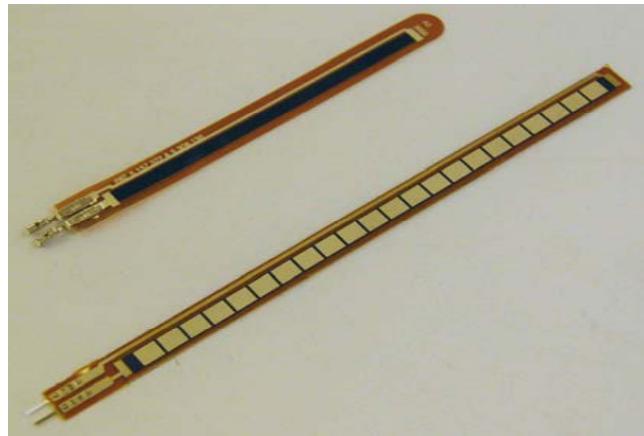


Symmetric Stops



# Electronics

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# SDM Animation

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Animation Assembly 4min.avi

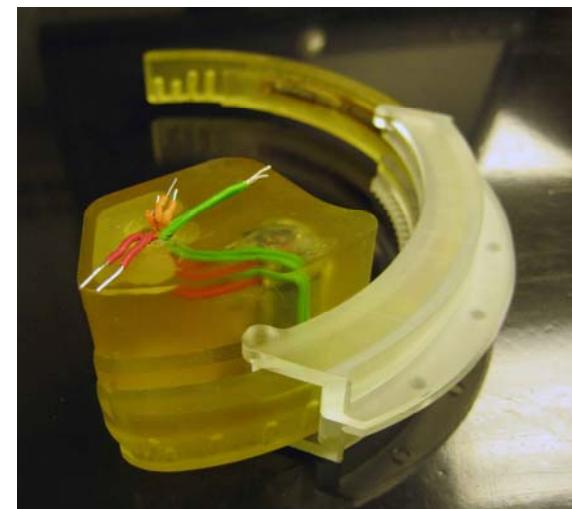
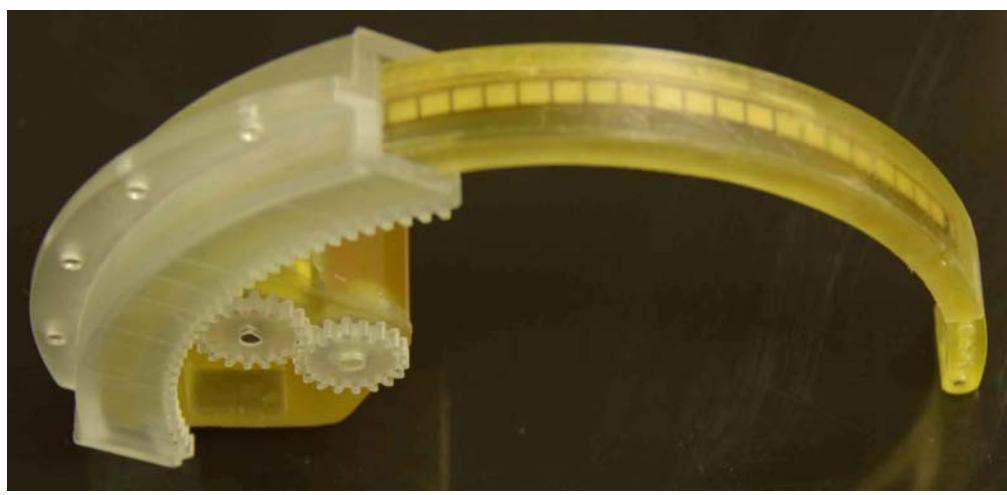
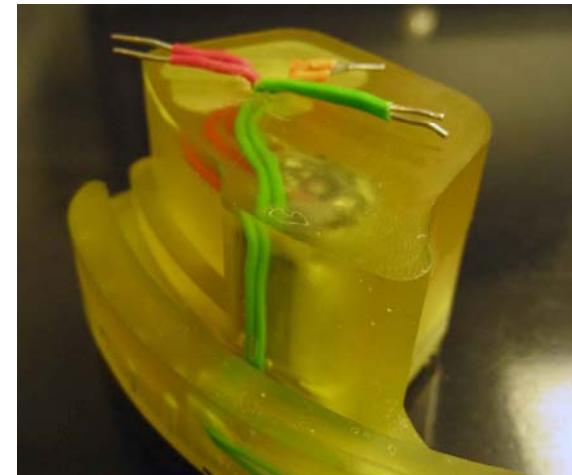
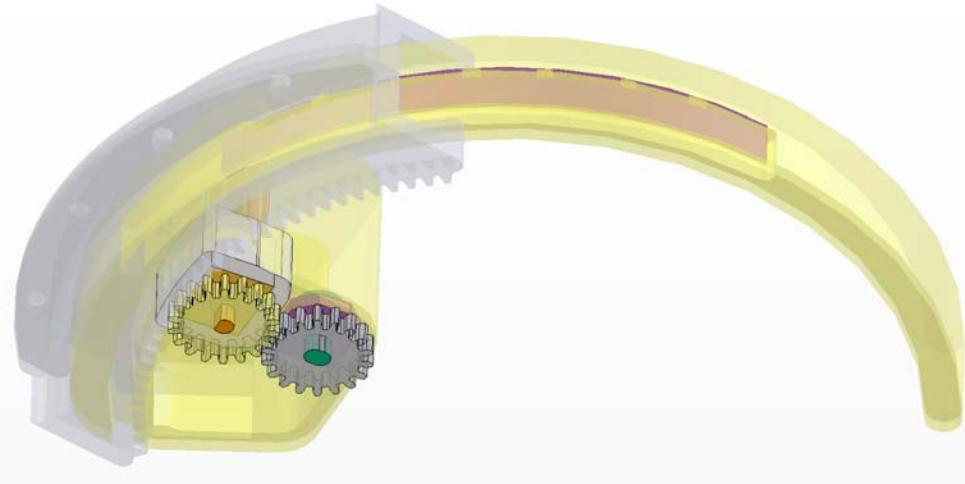


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# Final Product

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## Acknowledgments

Dr. Dan Koditschek

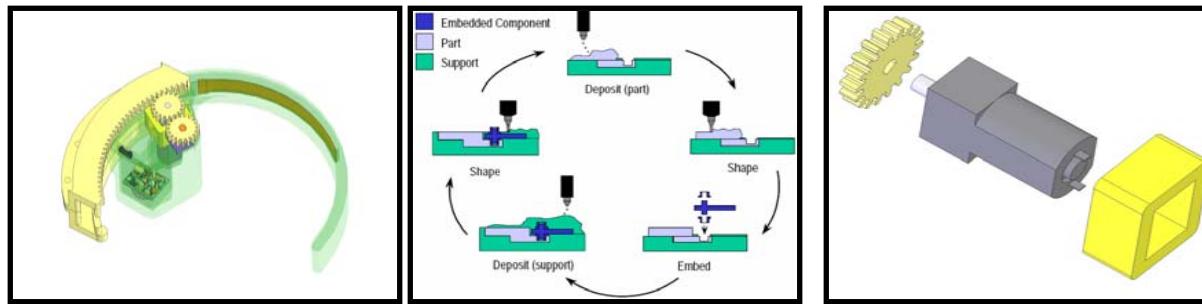
Dr. Jonathan Clark

Kevin Galloway

Sam Russem

Mulea Bereketab





## Questions

