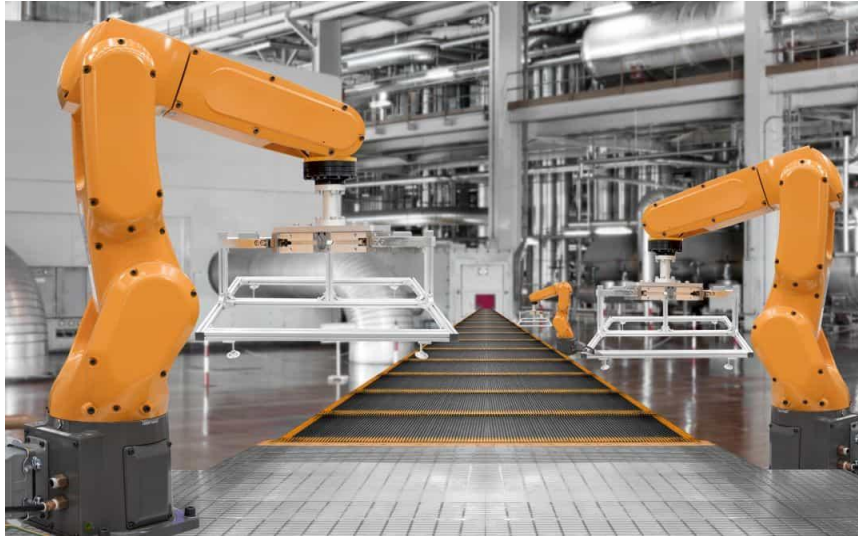# Building a Soft Muscle for a Robot

Courtney Duong, Nick Kamenica, Edgar Hernandez Mendoza

Mentor: Anna Alvarez

Hawkes Lab

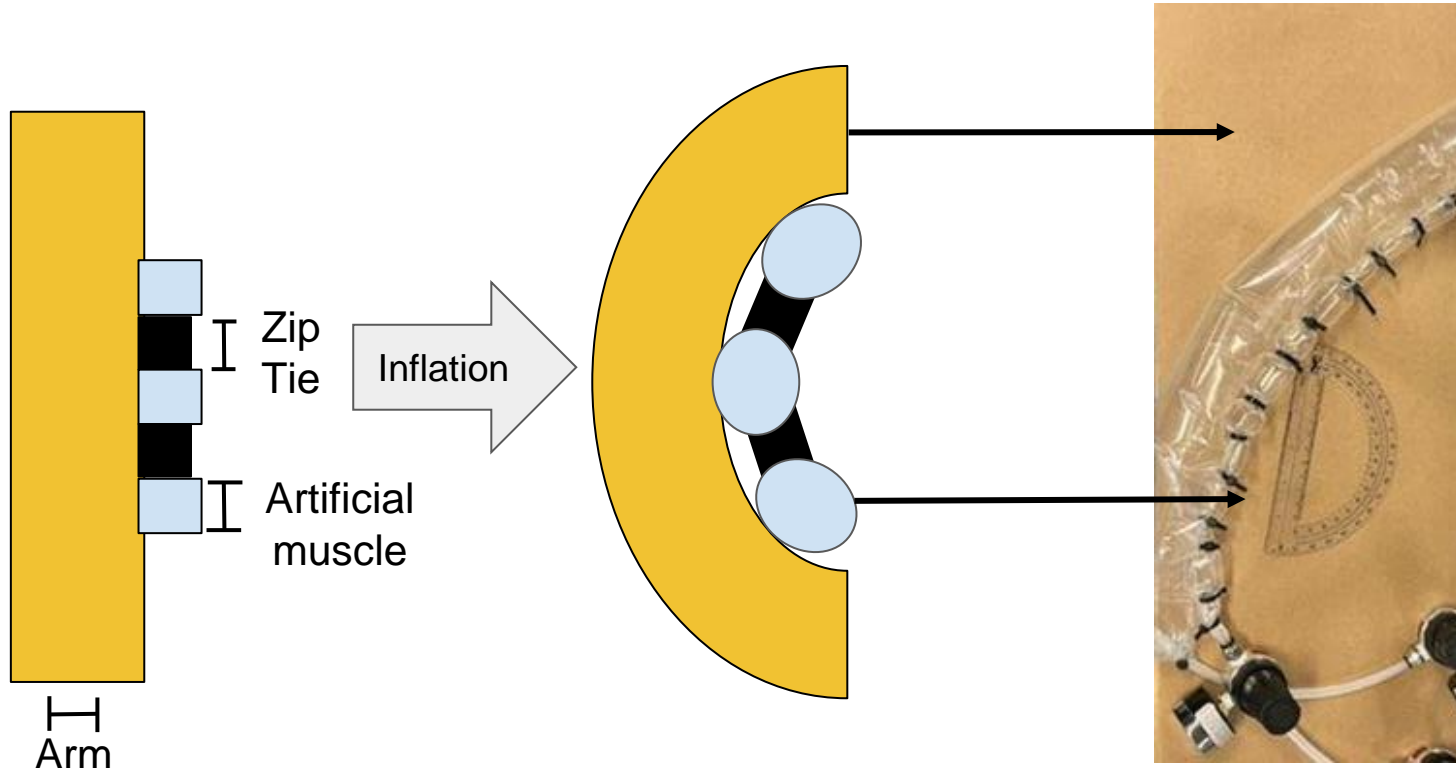# Soft robots excel in uncontrolled environments

[1]

Rigid Robots

[2]

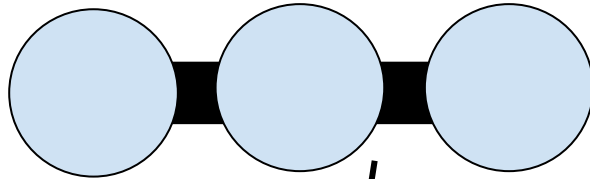**Soft Robot**

Optimizing maneuverability of robotic arms

Zip Tie

Inflation

Artificial muscle

Arm

Creating 3 different soft muscle shapes

Spaghetti

Meatball
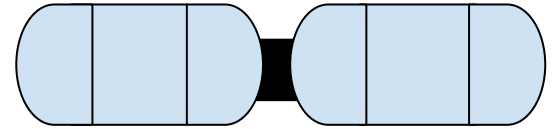
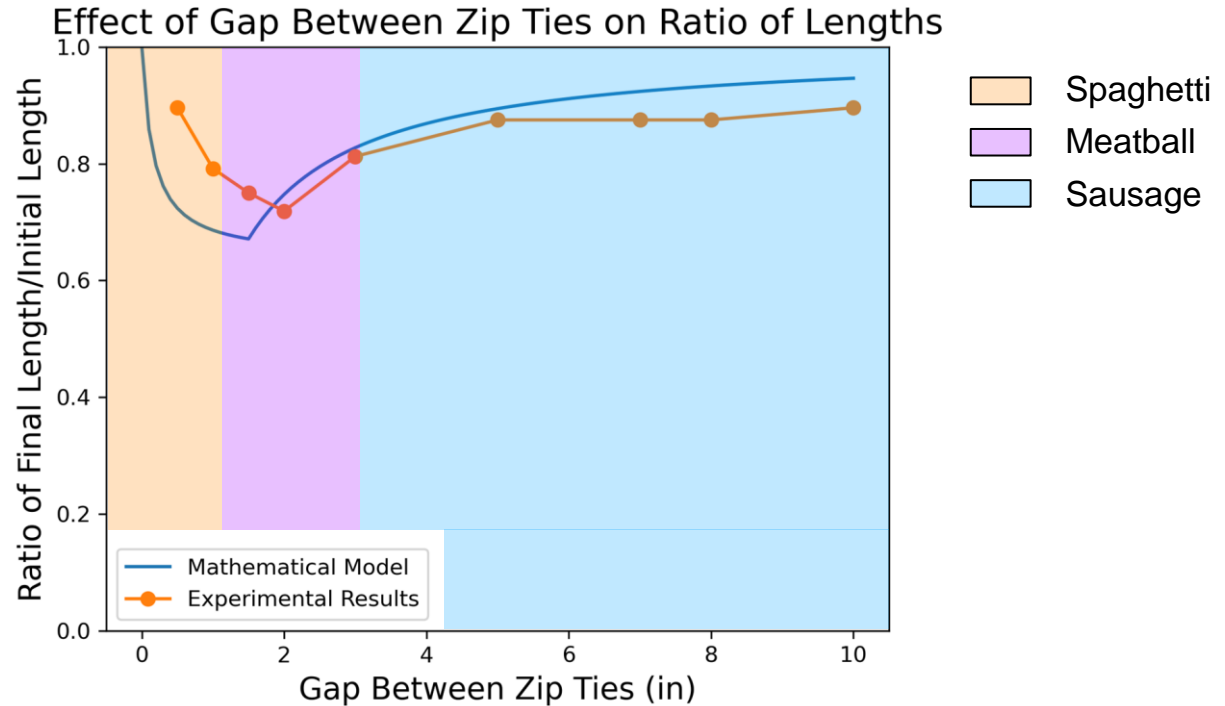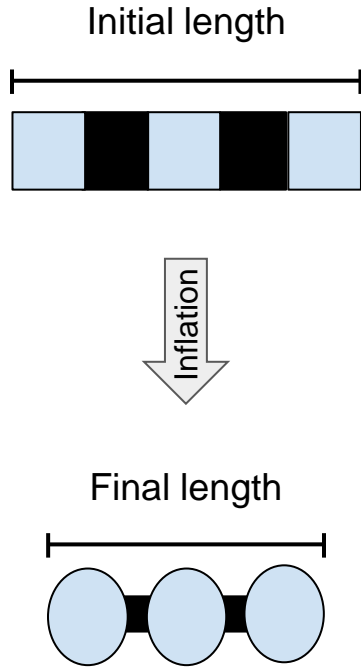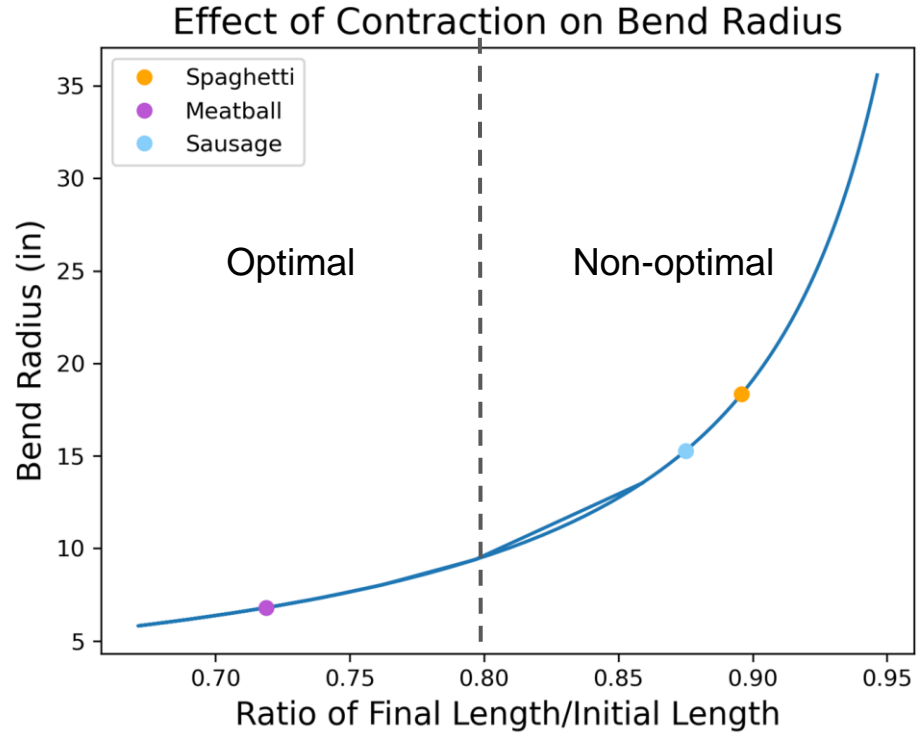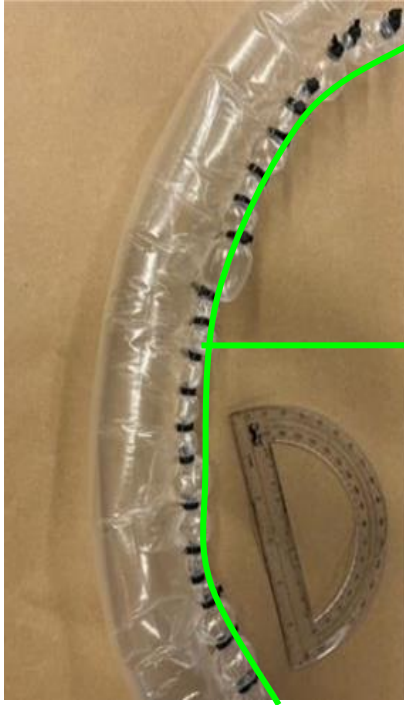**Sausage**

Length of zip tie gaps varies muscle contraction

Largest contraction provides smallest bending radius

Effect of Contraction on Bend Radius

radius

Optimal

Non-optimal

Bend Radius (in)

Ratio of Final Length/Initial Length

- Spaghetti
- Meatball
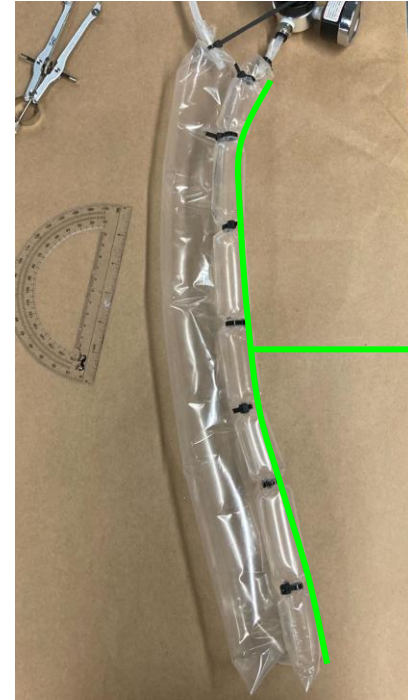- Sausage
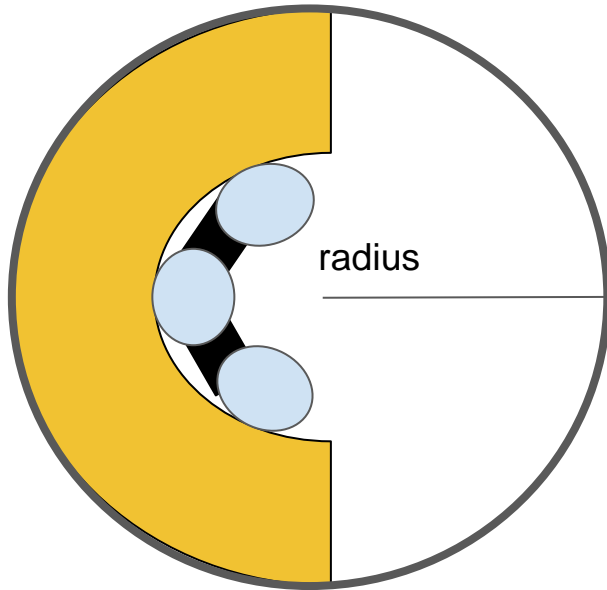
Meatball causes smallest bending radius

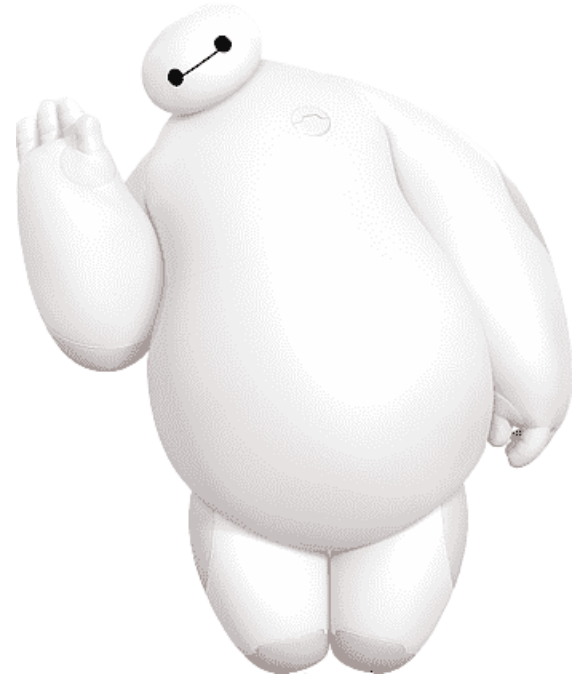**Spaghetti**
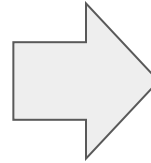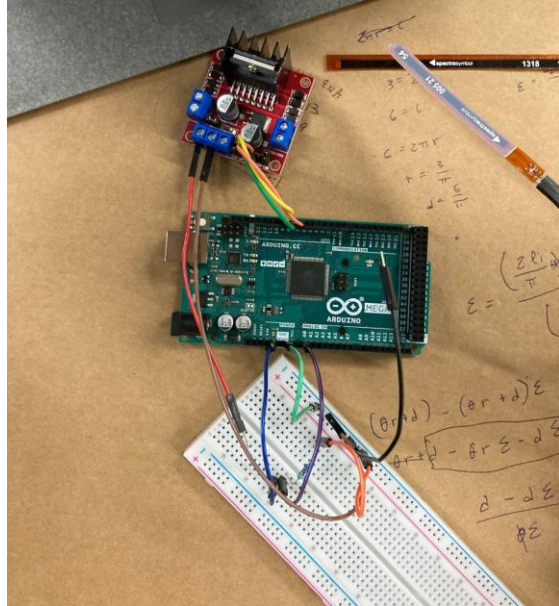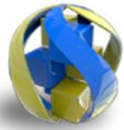

Radius
= 13.9 in

Meatball

Radius
= 10.1 in

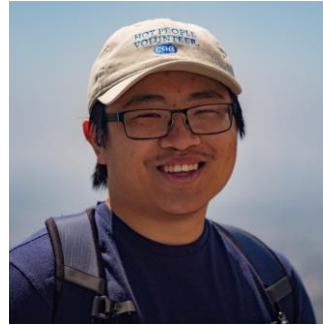**Sausage**

Radius
= 17.1 in

Developing autonomous robots

Acknowledgements

Henry Dong
Peer Mentor
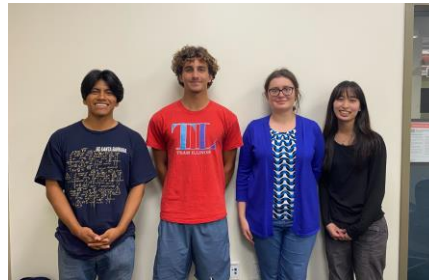
Anna Alvarez
PhD Student / Mentor

References

1: https://www.business-opportunities.biz/2021/01/02/applications-industrial-robot-arms/

2: Endotracheal Intubation | Pulmonary Associates (pasadocs.com)