



The Intersection of Mobile Robotics Education and Undergraduate Research

Dr. Carlotta A. Berry
Associate Professor,
Electrical & Computer
Engineering
Director, Robotics Minor &
ROSE-BUD

Tennessee State University
STEM Leadership Conference
April 22, 2016



Benefits of Undergraduate Research

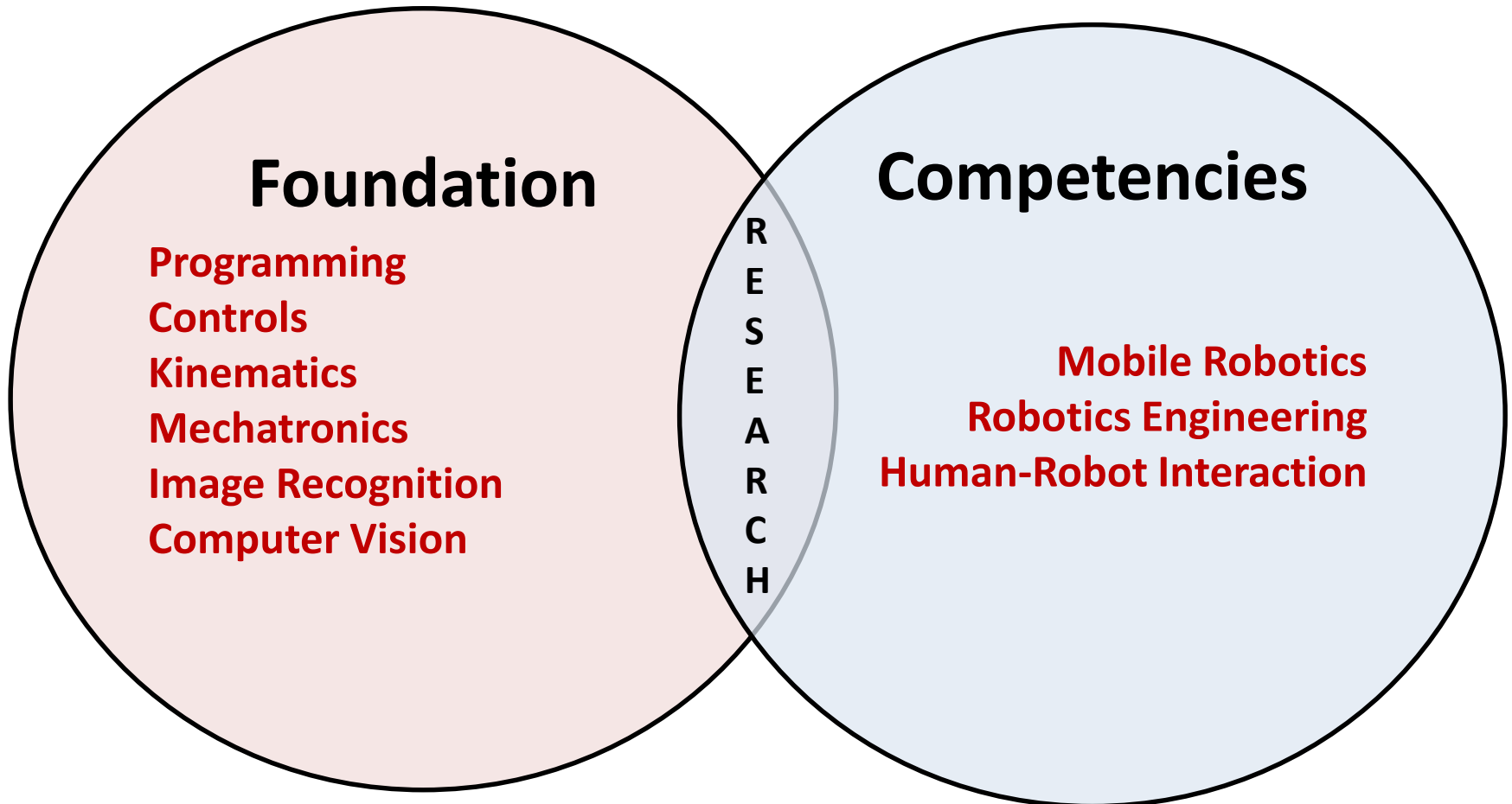
- Enhances student learning
- Develops critical thinking, creativity, problem solving, innovation, intellectual independence skills
- Develops understanding of research methodology
- Provides career preparation
- Mentoring relationship with faculty



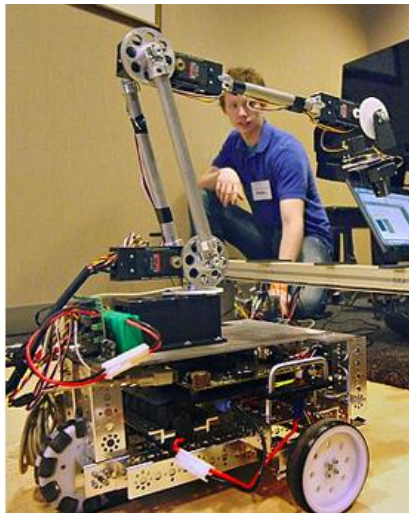
Council on Undergraduate Research Fact Sheet http://www.cur.org/about_cur/fact_sheet/



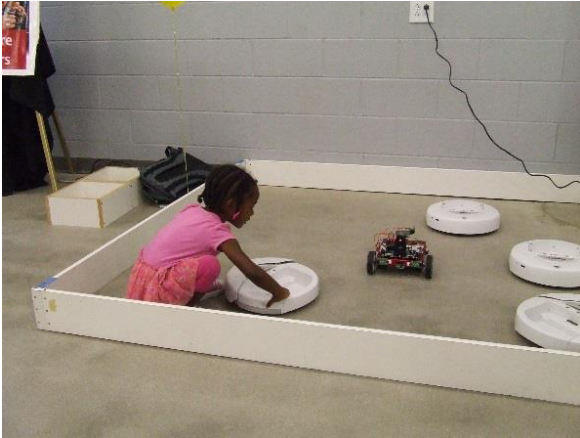
Robotics Education & Research



Robotics Education

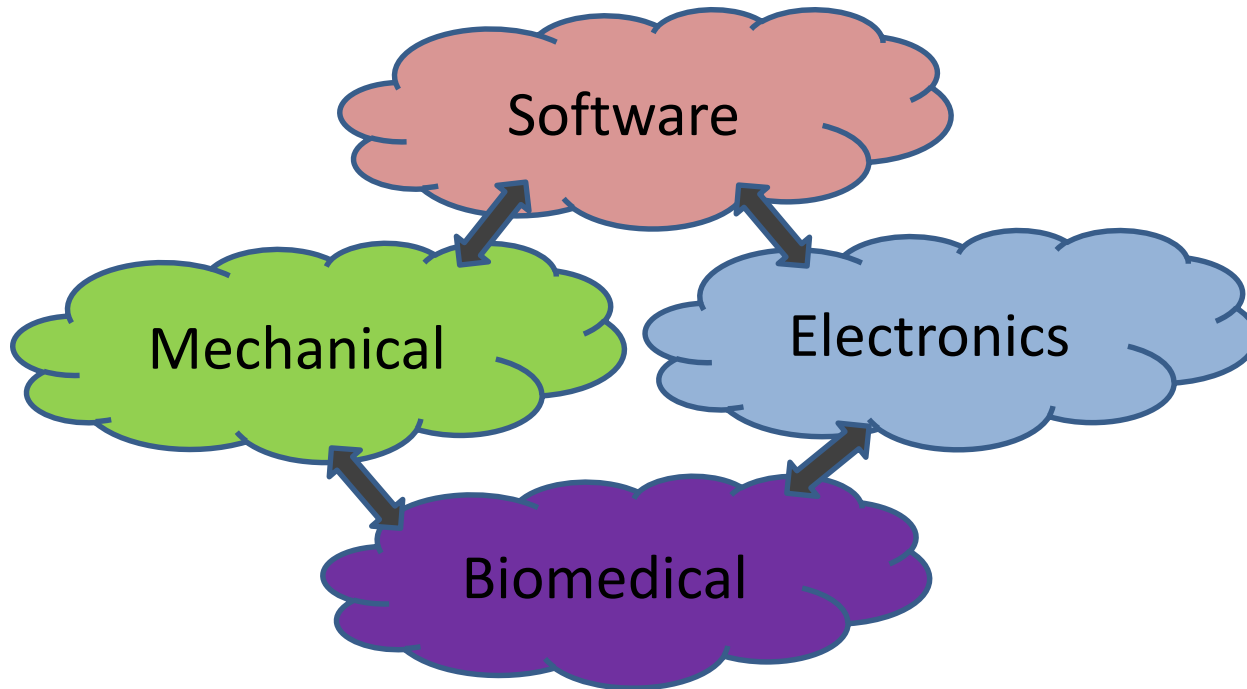


Robotics Service





Multidisciplinary Robotics



What is a Robot?

Autonomous

Perception

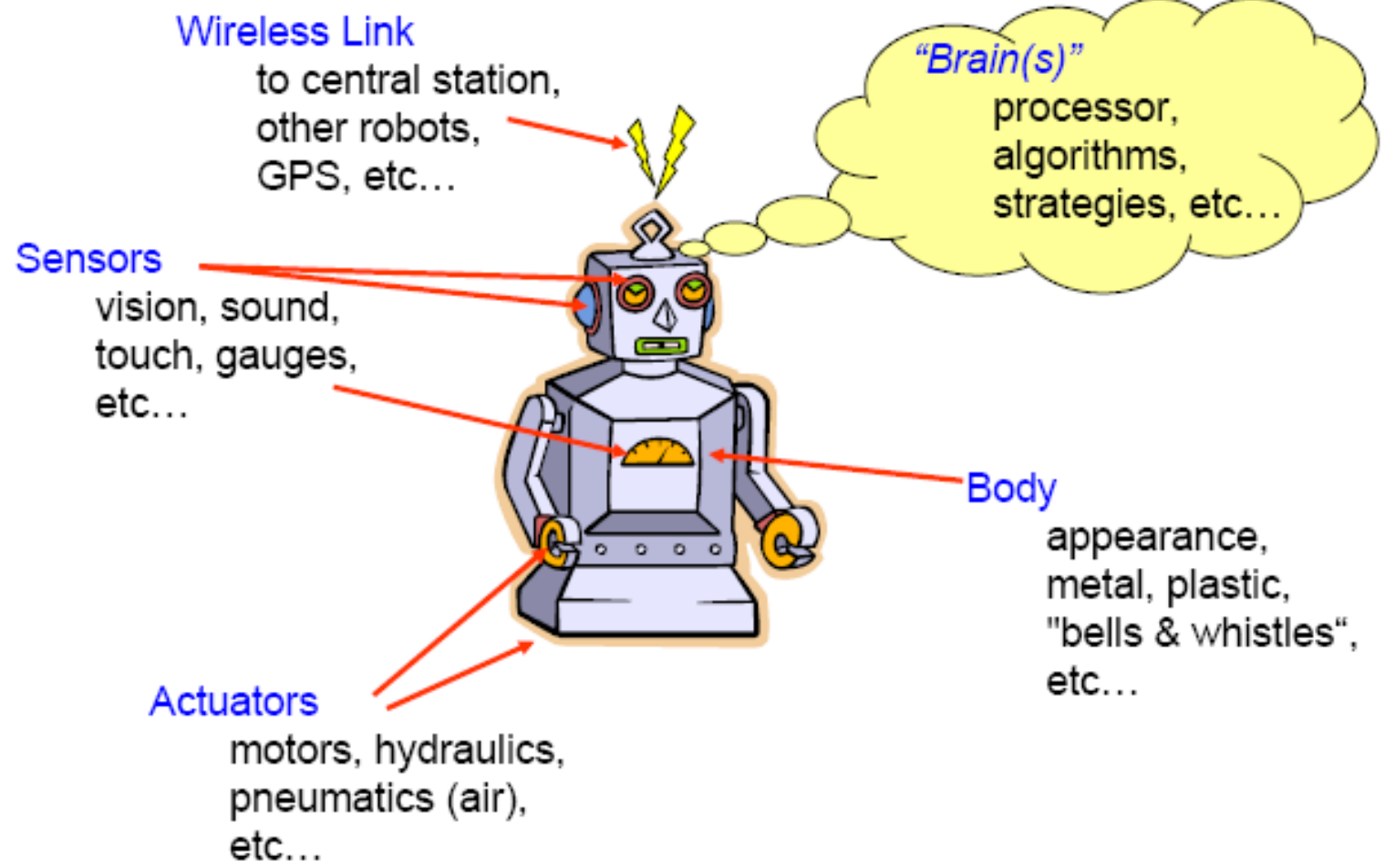
Embodiment

Acting

Goal/Task



Robot Components

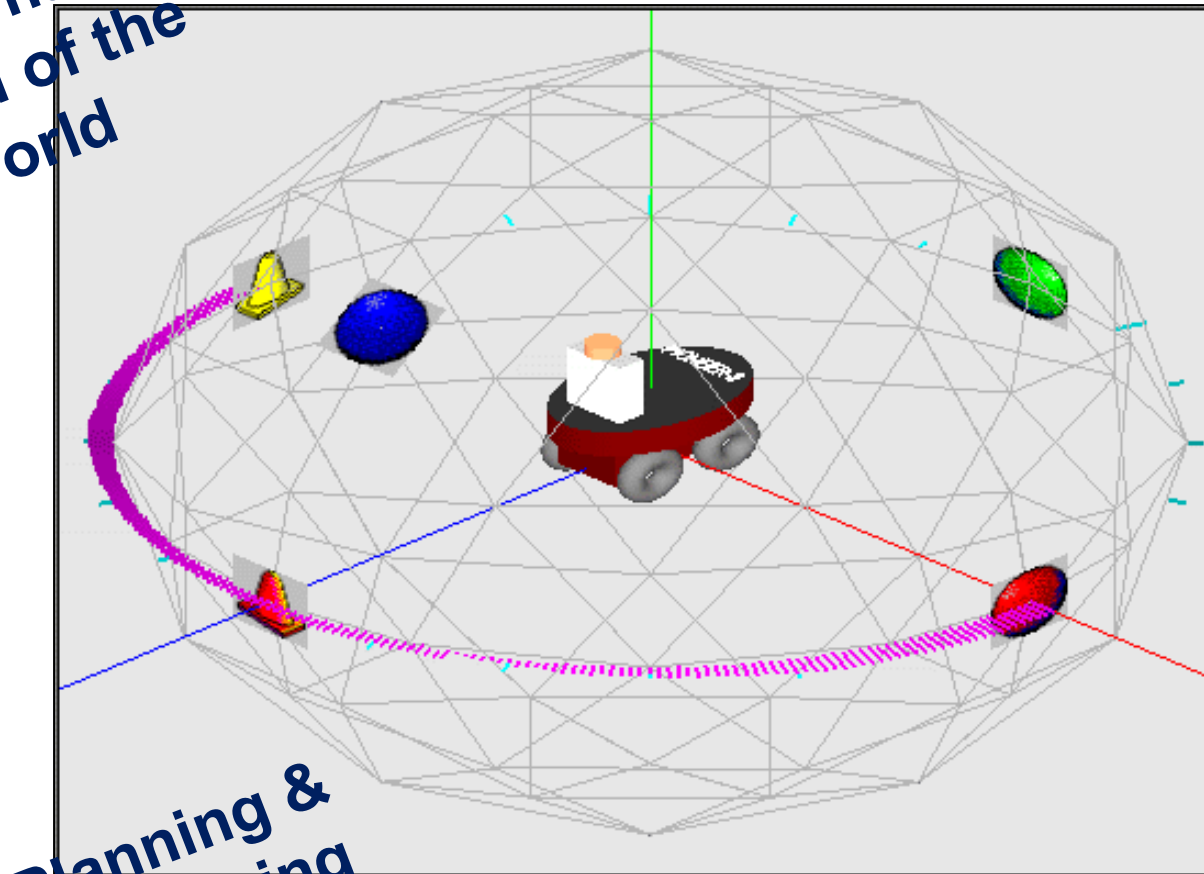


Artificial Intelligence (AI)

Search

Internal
model of the
world

Problem
Solving



Planning &
Reasoning

Knowledge
Representati
on

Robotics Control Spectrum

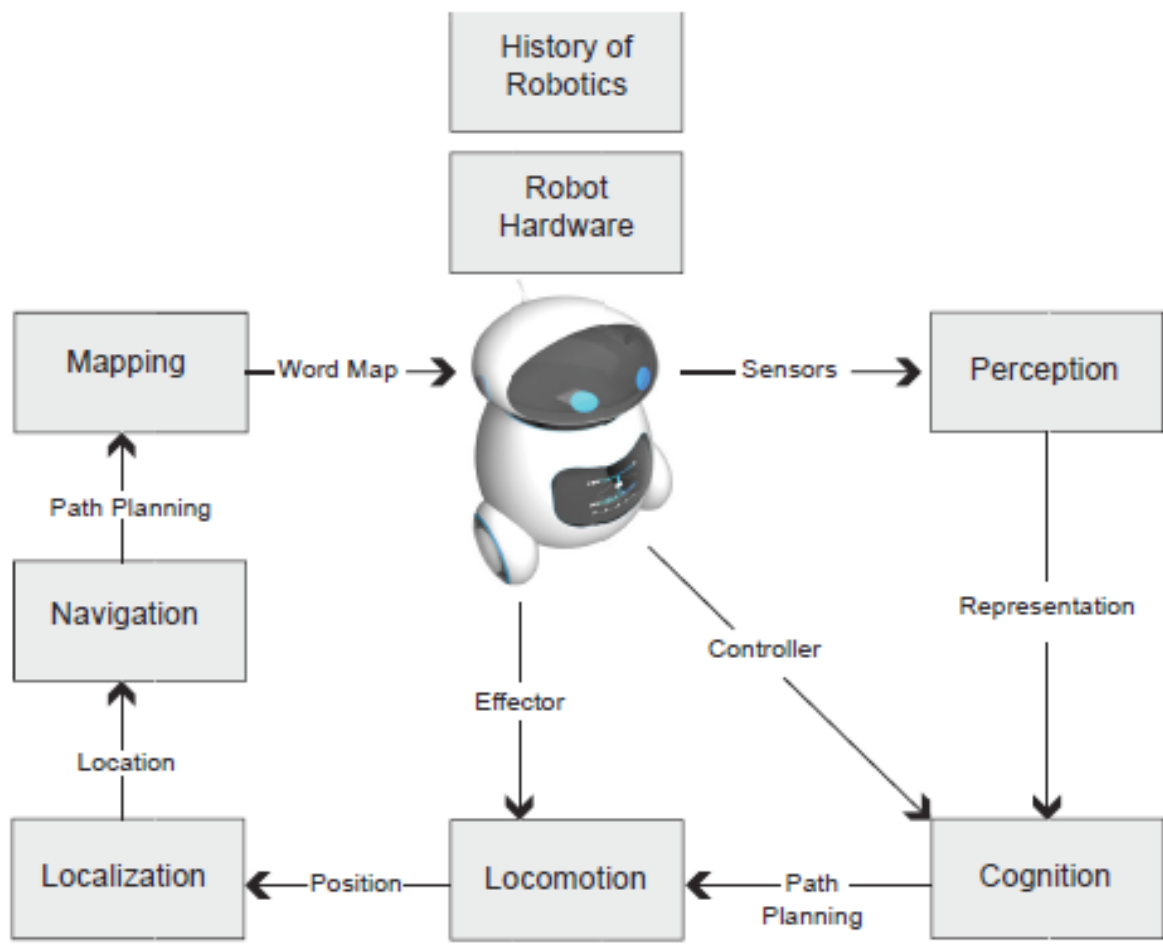


Figure 1.2: Mobile robotics cycle.



Mobile Robotics

HRI Concepts



Human-Robot Interaction Videos



Freshman Design

Lego and Arduino Robots

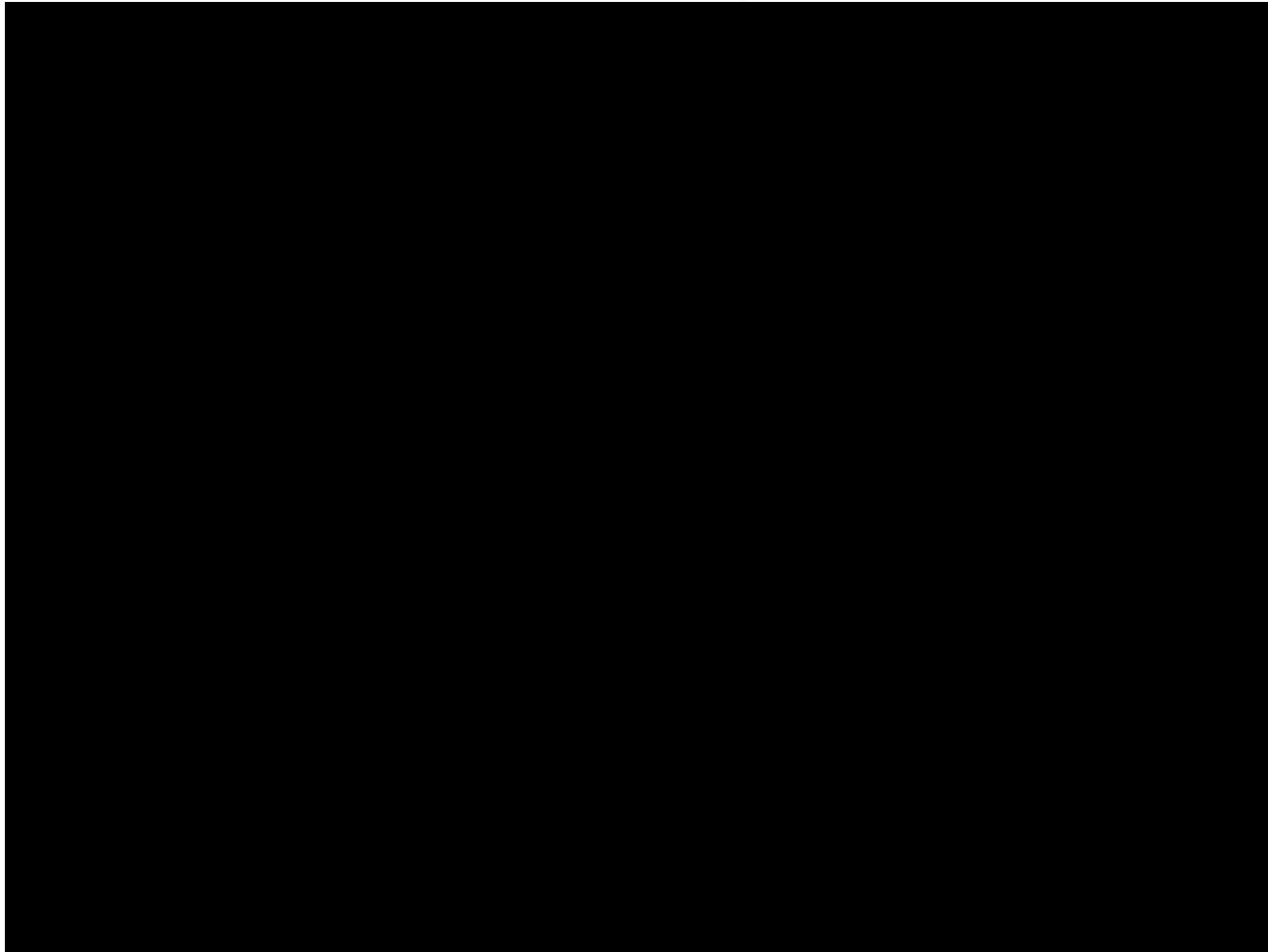
ROSE-HULMAN
INSTITUTE OF TECHNOLOGY

ROSE-HULMAN
INSTITUTE OF TECHNOLOGY



Mobile Robotics

AI Concepts

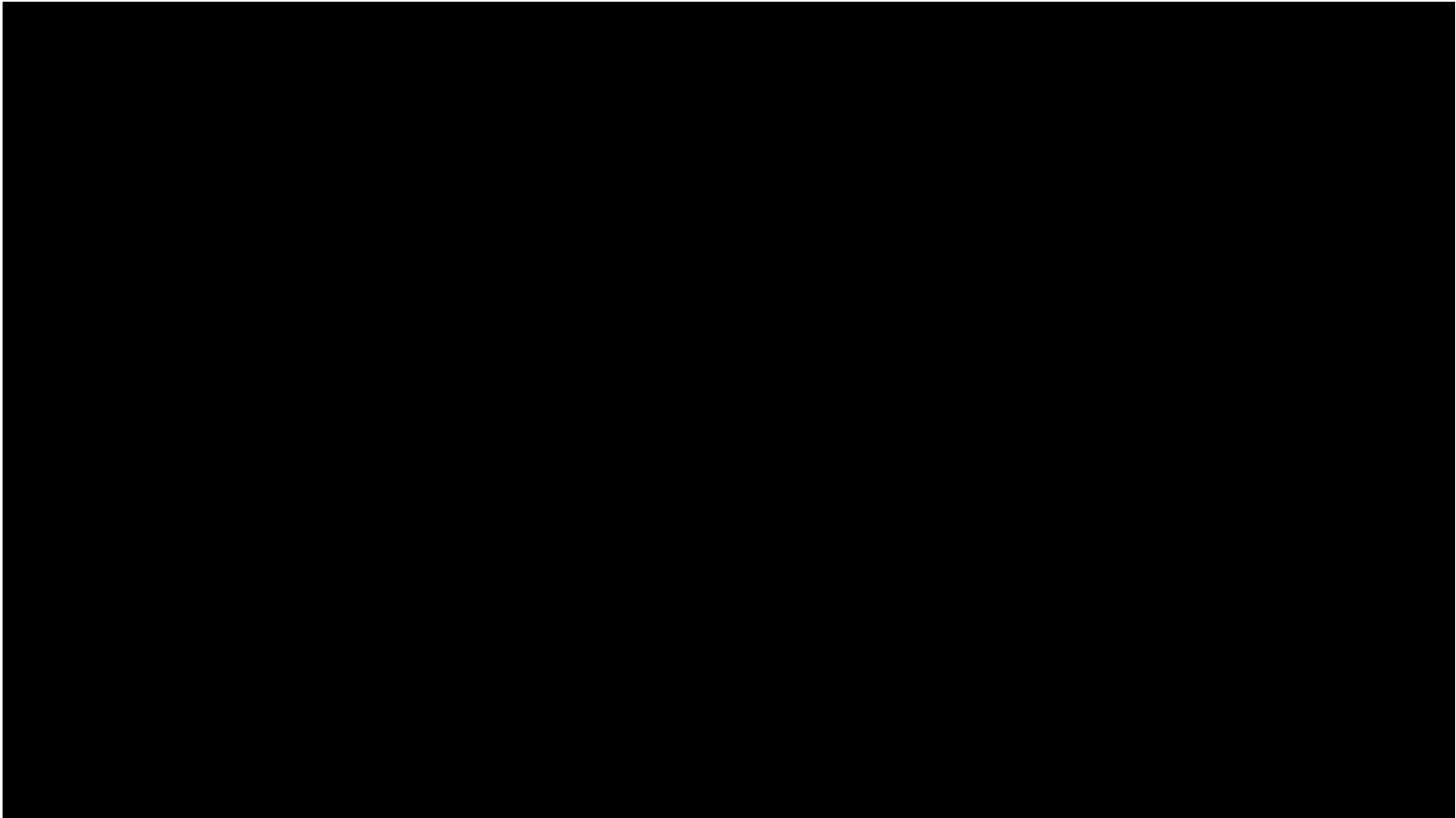


Robotics Engineering





Research Projects



Research Projects



Research Projects





Research Projects



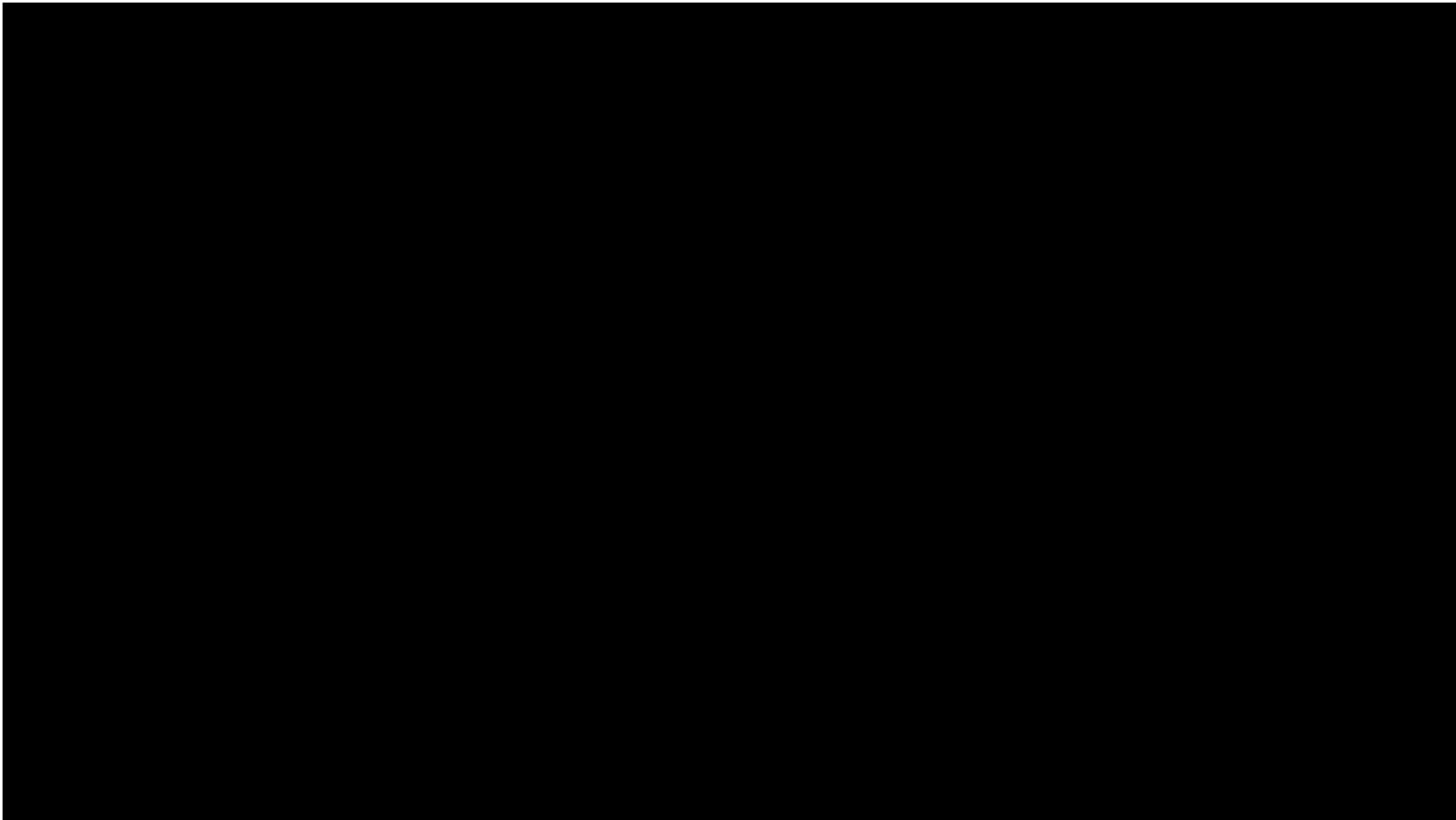


Research Projects





Research Projects



Conclusions

It is possible to conduct undergraduate robotics research with students by building foundational and essential robotics competencies over 4 years. This is essential for students and faculty to reap the benefits of undergraduate research.





Questions



www.rose-hulman.edu/~berry123

berry123@rose-hulman.edu