

Introduction

Why is robotics hard?

The State of Robotics: Rapid Progress, But a Long Way to Go



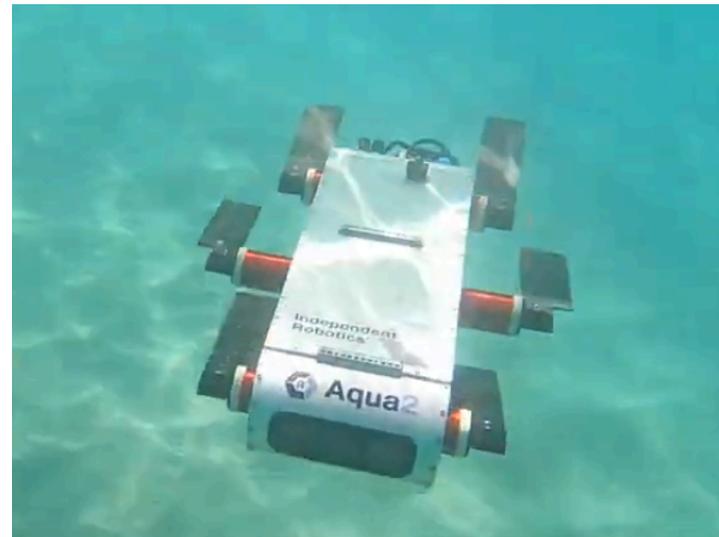
[Amazon Robotics]



[Waymo]



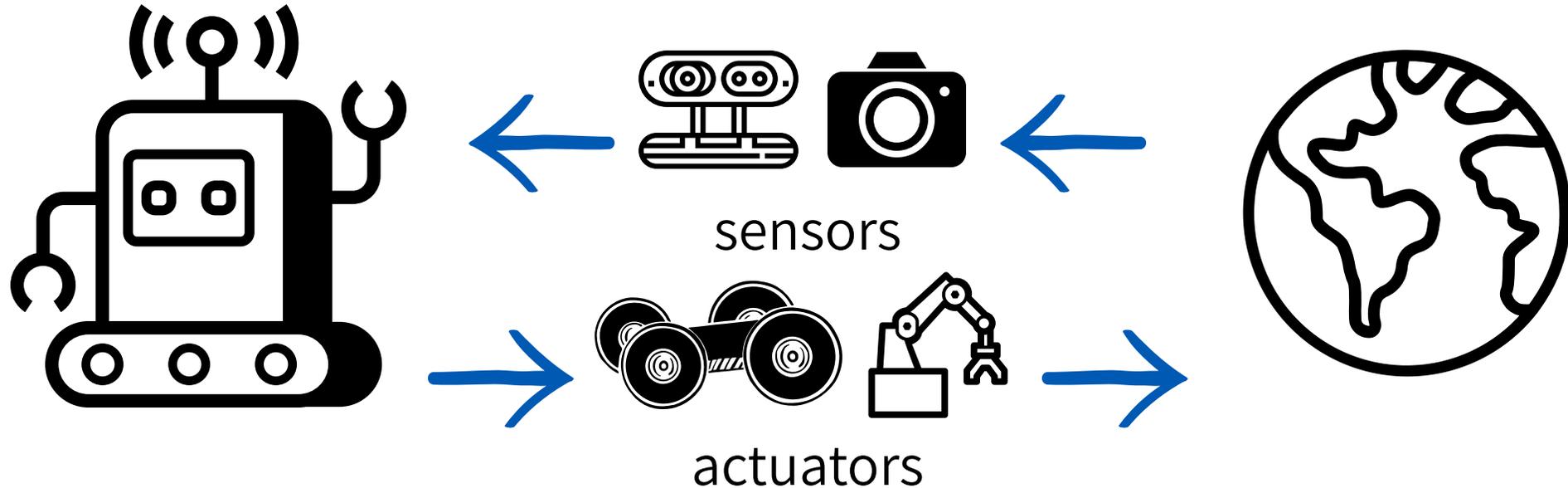
[Zipline]



[Independent Robotics]

The Fundamental Problem

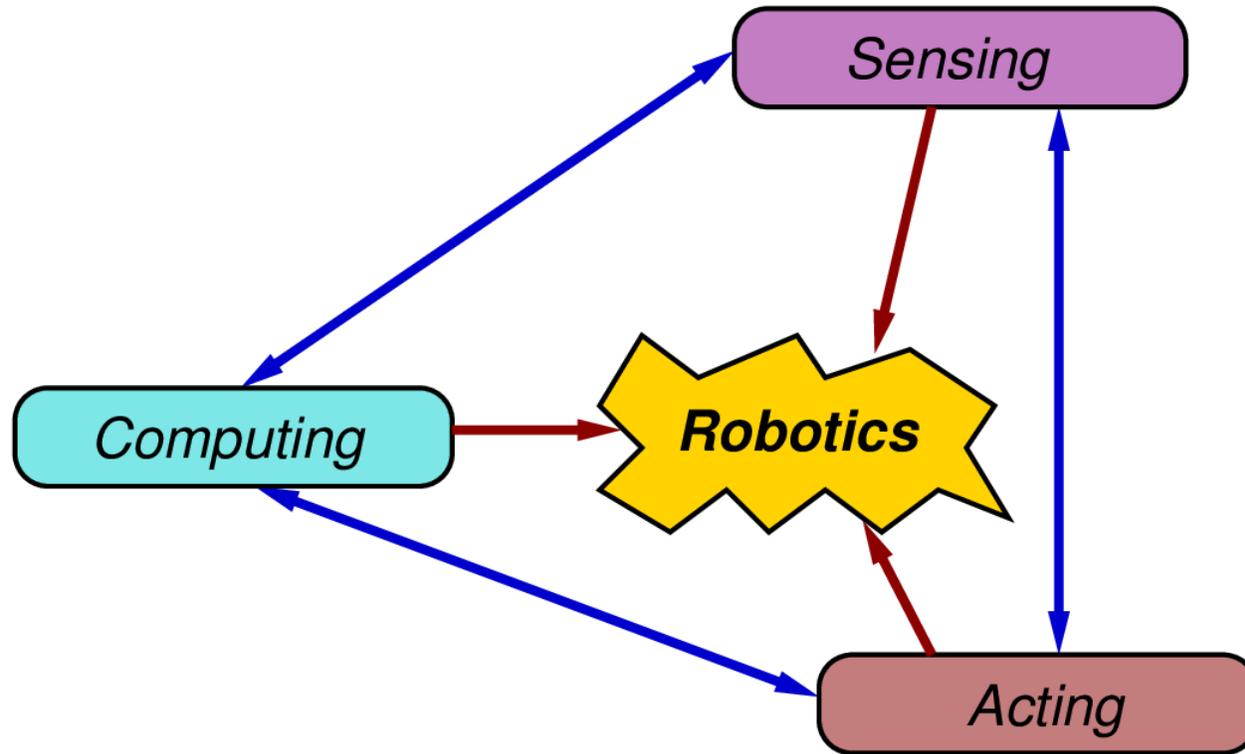
A robot relies on its **sensors** and **actuators** to interact with the world...



...but the world is **complex** and **unpredictable**.
...and the hardware is often **limited** or **unreliable**.

The Fundamental Problem

Robotics problems exist at the intersection **computation**, **action**, and **sensing**.



Example: Parallel parking

