Robots will have huge impact on everyday life in the next 10 years.

Computing will be centrally important to making this change happen.
Jobs in Robotics

The job market for computer scientists and computer engineers in robotics will continue to grow!
What is robotics all about?

Computing → Robotics

Robotics → Acting

Acting → Sensing

Sensing → Computing
Robotics is what happens when a computer interacts directly with the physical world.
Driverless Driving
Challenges

- Sensing the road (or lack thereof) and obstacles.
- Planning a course around those obstacles.
- Representing information about the world in a well-organized, efficient way.
- Safety is supremely important!
Challenges

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Soccer with Robots
Challenges

- **Teamwork** – Coordinating the strategies of the team members.
- **Planning** – Anticipating and countering strategies used by the other team.
- **Physics** – Predicting the outcome of the robots’ actions. How will the ball move?
Challenges

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Walking Robots

Boston Dynamics
Challenges

■ **Stability** – Make sure the robot stays upright.

■ **Unpredictability** – Make footsteps that will make progress on rough, unstable terrain.

■ **Real-time responsiveness** – React *very* quickly to unexpected changes.
Challenges

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Household Robots
Challenges

- Household robots must be tailored to their *particular applications*.
- They need to be *robust*.
- They also must be *inexpensive*.
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Computer Animation
Hide and Seek
Robotics Courses at USC

CSCE574 – Robotics
Combination of hands-on labs and underlying theory.