# Autonomous Robotics

## Social Impacts

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# Announcements

Last week 🎉 🎉 🎉

Final project key dates:

- Midnight tonight: deadline to be included in the tournament.
- May 2: final deadline.

Please complete your course evaluation! 🙏

# Learning Outcomes

After today's lecture, you will:

- Be able to identify a set of broader societal concerns surrounding robotics.
- Have discussed navigating these concerns.

What if we succeed?

# Meta Questions

Can society collectively oppose something profitable?

Why is self-replicating technology inherently different from other dangerous technologies?

What positions do we have between techno-optimist and luddite?

# Robot Economics

Varying forecasts of how fast work will be automated.

> Hard to fully automate what a person does, but significant parts of a person's job may be automated.

Imagine if every imaginable job in the world could be done by a robot.

Imagine if almost all jobs in the world could be done by a robot.

Questions:

1. How will people find meaning?

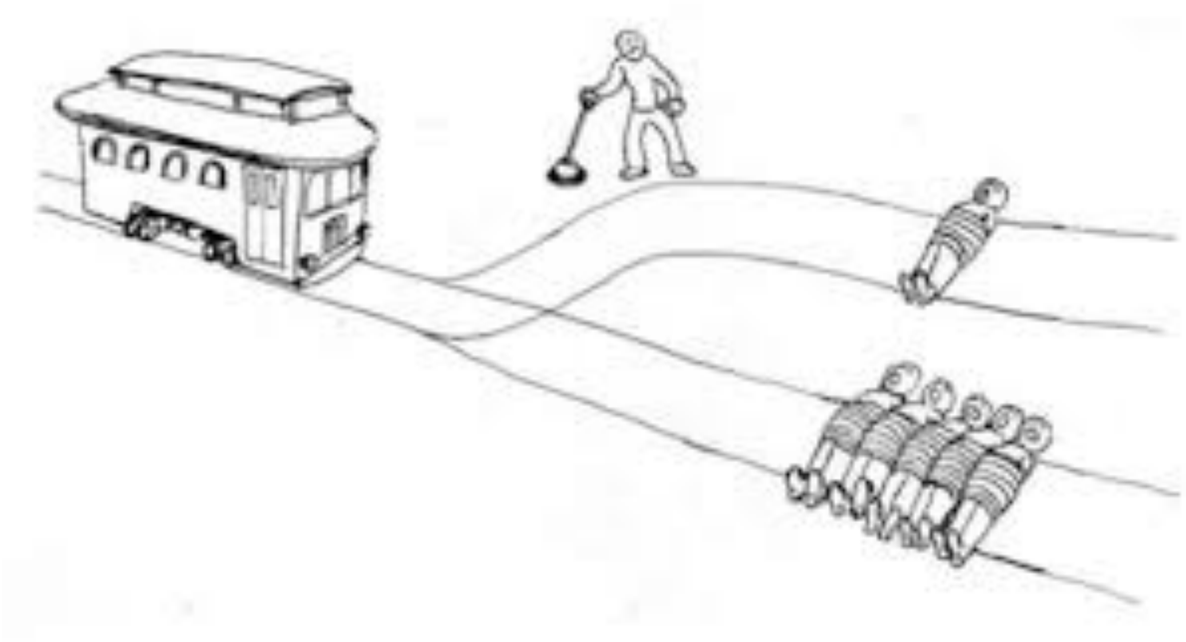
2. How will society value people?

**Economic possibilities for our Grandchildren**

# Robot Ethics

How do we ensure that robots take ethical actions?

Who’s ethics do we put into robots?

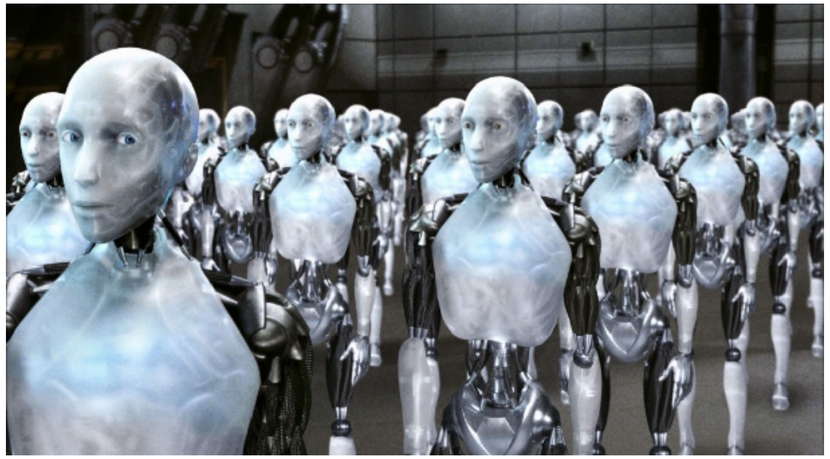


# Asimov’s Three Laws of Robotics

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.

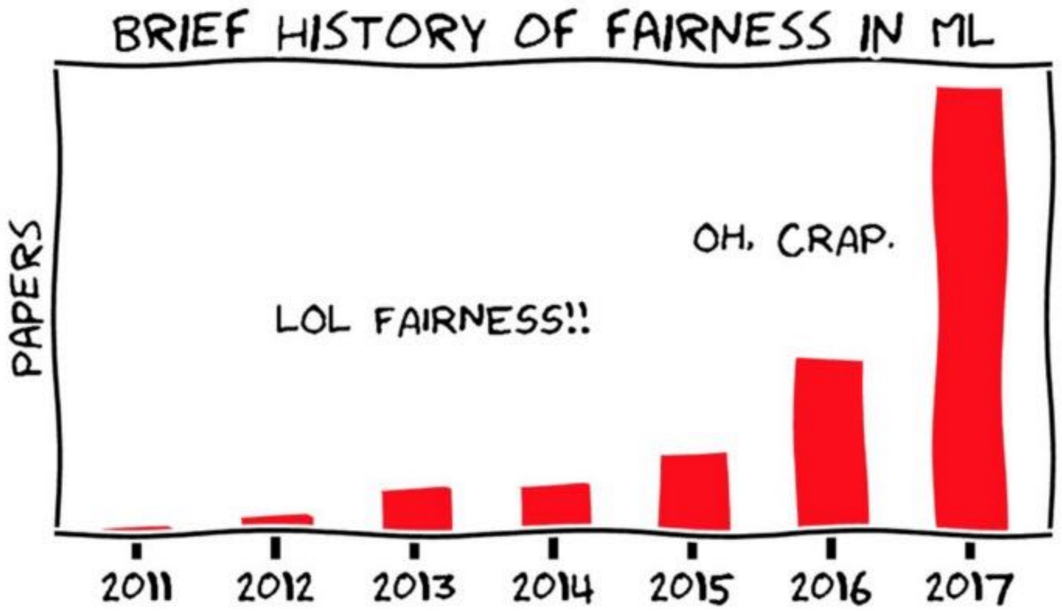
2. A robot must obey orders given it by human beings except where such orders would conflict with the First Law.

3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.



# AI Ethics

Robots are increasingly built using AI methods.





*Our test used Amazon Rekognition to compare images of members of Congress with a database of mugshots. The results included 28 incorrect matches.*

The false matches were disproportionately of people of color, including six members of the Congressional Black Caucus, among

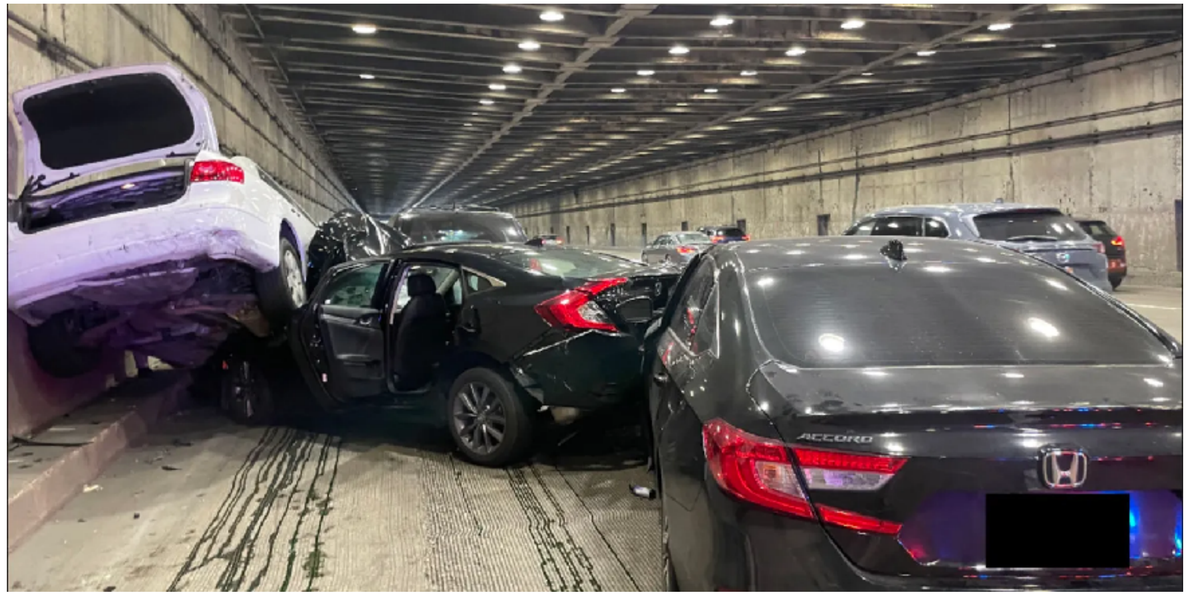
https://www.aclu.org/blog/privacy-technology/surveillance-technologies/amazor recognition-falsely-matched-28

https://towardsdatascience.com/a-tutorial-on-fairness-in-machine-learning-3ff8ba1040cb

# Responsibility

How can we develop guardrails for autonomous robots?

Who is responsible when a robot makes a mistake?



# Military Usage

Robots are a dual-use technology.

- The technical challenges of search and rescue drones are similar to those of assassin drones.

The use of autonomy in warfare raises many questions:

- How autonomous should robots be in battle?
- When should a robot decide to use lethal force?
- Should a human always be in the loop for this decision?
- When is a lethal robot reliable enough for use?

# Robot Rights

Should robots have rights?

As robot autonomy progresses, how would you determine when a robot should have a certain right?


Sophia the robot
Saudi Arabia's first robot citizen

# Further Reading (many others)

1. Weapons of Math Destruction - Cathy O’Neil
2. AI Superpowers - Kai-fu Lee
3. Who Owns the Future - Jaron Lanier
4. The Alignment Problem - Stuart Russell
5. Humans Need Not Apply - Jerry Kaplan

# Action Items

Final project!

One more class!