

# SEEM3510 Human-Computer Interaction

Helen Meng

Department of Systems  
Engineering & Engineering  
Management

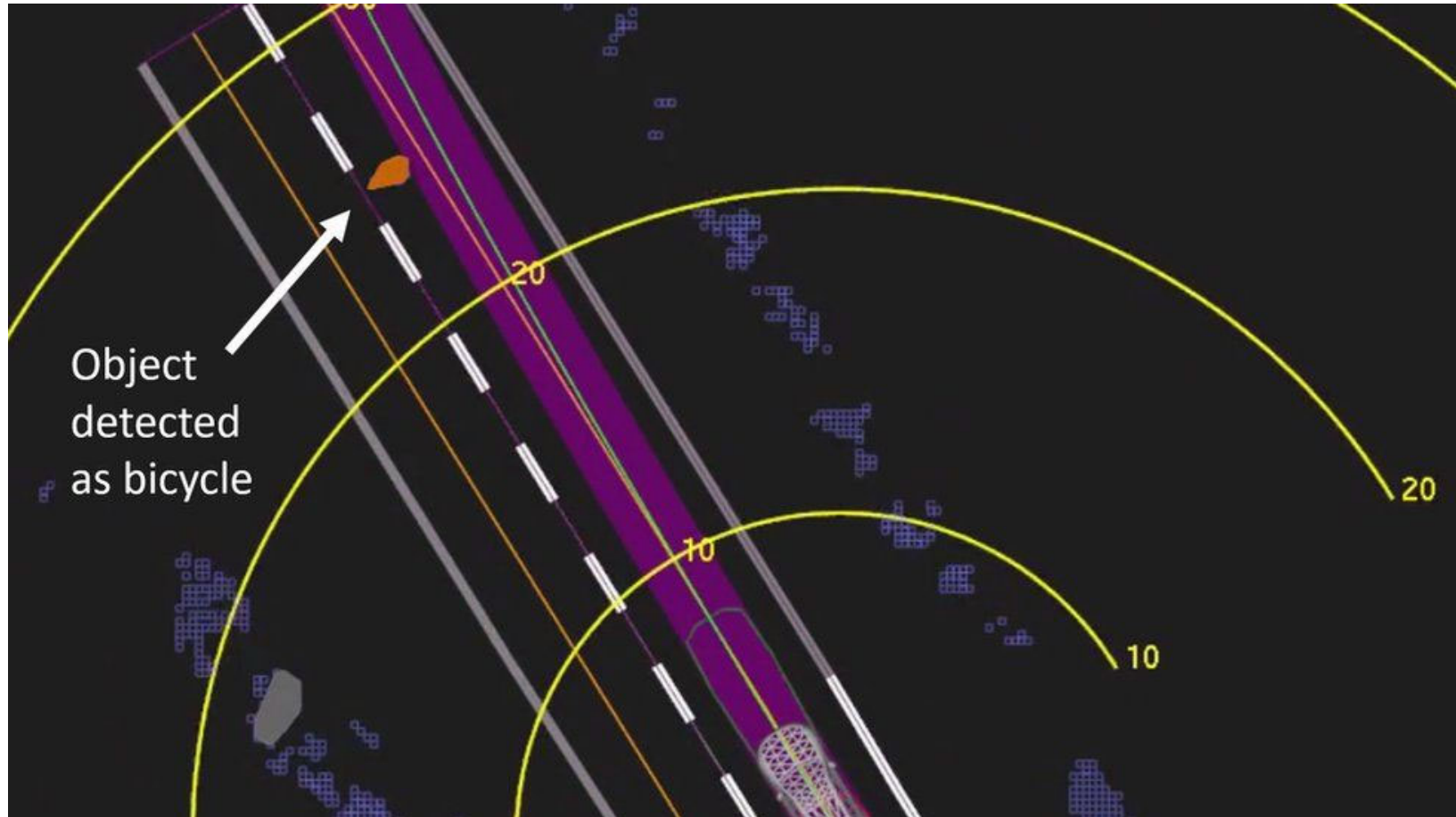
Philip Fu

Department of Computer  
Science & Engineering

Spring 2022

Week 3 Guidelines, Principles and Theories

# Case Study – Self-driving Car



Source: <https://www.bbc.com/news/technology-54175359>

# Developer and PM (User)



Source: bilibili

# A Story

*A man and his son are in a terrible accident and are rushed to the hospital in critical care. The doctor looks at the boy and exclaims, "I can't operate on this boy, he is my son!"*



nurse



All

**Images**

News

Videos

Maps

More

Settings

Tools

Collections

SafeSearch

clip art

cartoon

hospital

student

medical

registered

logo



Registered Nurse (8 hours Caring Services)  
shop.qhms.com



School of Nursing  
nursing.hku.hk



health care needs its Fi...  
scmp.com



Moorfields nurse, Angelin...  
hkg.orbis.org



Registered Nurse (254415) 香港  
aasmigration.com.hk



nurses in China balances doctor ratio ...  
chinadaily.com.cn



Master of Nursing Science (Pre ...  
nur.cuhk.edu.hk



Nursing Agency  
qhms.com



Centralised vs decentralised nursing ...  
today.mims.com



Rei  
lib



HKSH CAREERS | 養和職位空缺  
hksh.com



Pioneer transforms nurse clinic ...  
www3.ha.org.hk



Renal Nursing Training – The Integrate...  
dialysis.com.hk



Renal Nursing Training – The Integrated...  
dialysis.com.hk





programmer



All

Images

Maps

News

Videos

More

Settings

Tools

Collections

SafeSearch

wallpaper

computer

code

life

hacker

software

anime

sto



A day in the life of a programmer ...  
jaxenter.com



Don't Be A Programmer - YouTube  
youtube.com



COMMENT: How computer programming ...  
news.efinancialcareers.com



10 Things Every Programmer Should Kno...  
medium.com



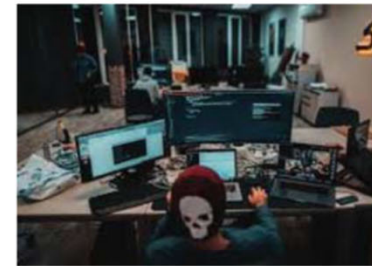
Top 5 programming languages every ...  
learnworthy.net



jobs for computer programmers | Ace Subido  
acesubido.com



Professional Development Programmer ...  
dreamstime.com



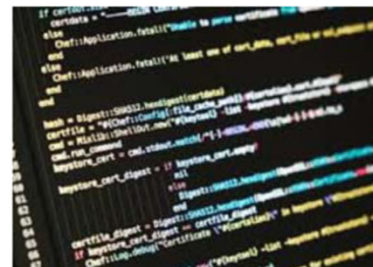
an Entry-Level Programmer Need ...  
medium.com



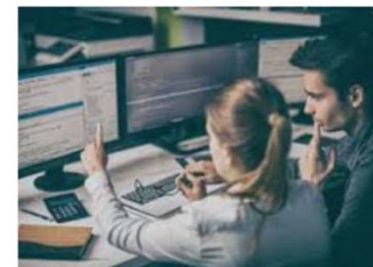
My Future Job: a Computer Programmer ...  
in2english.net



Average Programmer Salary is Soli...  
insights.dice.com



Become A Better Programmer On The Job  
forbes.com



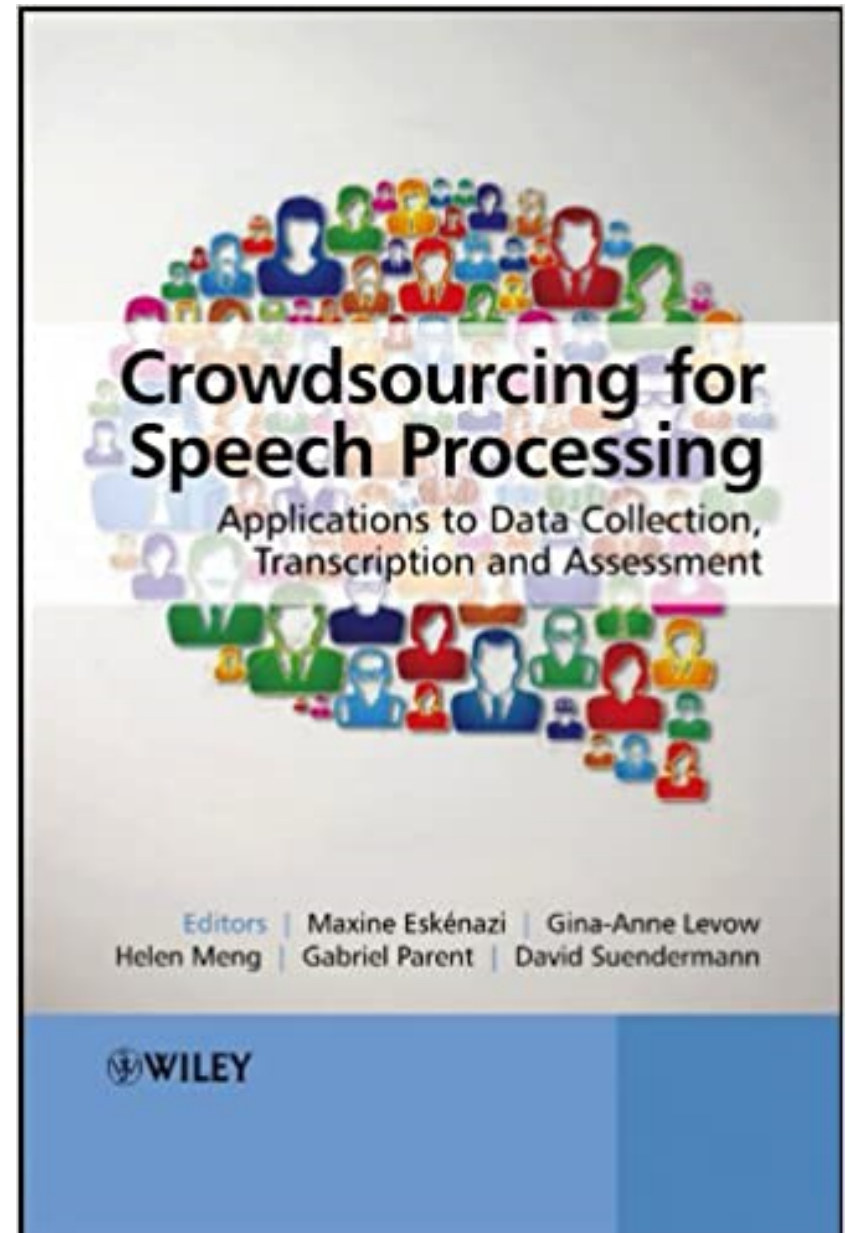
Cons of Becoming a Programmer Analyst ...  
blog.herzing.ca




Java F  
careert

# Crowdsourcing

- Obtaining information or input into a task or project by enlisting the services of a large number of people, typically via the Internet
- E.g. crowdsource data labeling




NET

SEARCH

[Home](#) | [Explore](#)  
[About](#) | [Download](#)

14,197,122 images, 21841 synsets indexed

Not logged in. [Login](#) | [Signup](#)

# ImageNet

- Overview
- Research Team
- Summary and Statistics
- Citations and Publications
- Interesting Articles
- Join ImageNet Mailing List
- API Documentation
- Sponsors

## Overview

Welcome to the ImageNet project! ImageNet is an ongoing research effort to provide researchers around the world an easily accessible image database. On this page, you will find some useful information about the database, the ImageNet community, and the background of this project. Please feel free to contact us if you have comments or questions. We'd love to hear from researchers on ideas to improve ImageNet.

### What is ImageNet?

ImageNet is an image dataset organized according to the WordNet hierarchy. Each meaningful concept in WordNet, possibly described by multiple words or word phrases, is called a "synonym set" or "synset". There are more than 100,000 synsets in WordNet. Each synset is illustrated by a set of images. ImageNet will offer...

## About ImageNet

- Overview
- Research Team
- Summary and Statistics
- Citations and Publications
- Interesting Articles
- Join ImageNet Mailing List
- API Documentation
- Sponsors

### Senior Research Team

- [Prof. Li Fei-Fei](#), PI, Stanford University
- [Prof. Jia Deng](#), Princeton University
- [Prof. Olga Russakovsky](#), Princeton University
- [Prof. Alex Berg](#), University of North Carolina, Chapel Hill
- [Prof. Kai Li](#), Princeton University

### Advisors and Friends

### Who uses ImageNet?

We envision ImageNet as a useful resource to researchers in the academic world, as well as educators around the world.

### Does ImageNet own the images? Can I download the images?

No, ImageNet does not own the copyright of the images. ImageNet only provides thumbnails and URLs of images, in a way similar to what image search engines do. In other words, ImageNet compiles an accurate list of web images for each synset of WordNet. *For researchers and educators who wish to use the images for non-commercial research and/or educational purposes, we can provide access through our site under certain conditions and terms. For details click [here](#)*



# Seeing through the Human Reporting Bias: Visual Classifiers from Noisy Human-Centric Labels

Ishan Misra<sup>1</sup> \*

C. Lawrence Zitnick<sup>3</sup>

Margaret Mitchell<sup>2</sup>

Ross Girshick<sup>3</sup>

<sup>1</sup>Carnegie Mellon University

<sup>2</sup>Microsoft Research

<sup>3</sup>Facebook AI Research

## Abstract

When human annotators are given a choice about what to label in an image, they apply their own subjective judgments on what to ignore and what to mention. We refer to these noisy “human-centric” annotations as exhibiting human reporting bias. Examples of such annotations include image tags and keywords found on photo sharing sites, or in datasets containing image captions. In this paper, we use these noisy annotations for learning visually correct image classifiers. Such annotations do not use consistent vocabulary, and miss a significant amount of the information present in an image; however, we demonstrate that the noise in these annotations exhibits structure and can be modeled. We propose an algorithm to decouple the human reporting

*What is in the image?*  
*What is worth saying?*

Our results show significant improvements over traditional algorithms for both image classification and image captioning, doubling the performance of existing methods in some cases.

## 1. Introduction

(a) A woman standing next to a **bicycle** with basket.



	Human Label	Visual Label
Bicycle	✓	✓

(b) A city street filled with lots of people walking in the rain.



	Human Label	Visual Label
Bicycle	✗	✓

(c) A **yellow** Vespa parked in a lot with other cars.



	Human Label	Visual Label
Yellow	✓	✓

(d) A store display that has a lot of bananas on sale.



	Human Label	Visual Label
Yellow	✗	✓

# Machine-labelled Images



Source: Images donated by Googlers

# Machine Translation

4/5/2020

Google Translate

---

ENGLISH

MALAY

---

She works as a nurse.  
She works as a programmer.

Dia bekerja sebagai jururawat.  
Dia bekerja sebagai seorang pengaturcara.

# Machine Translation (2)

4/5/2020

Google Translate

---

MALAY

ENGLISH

---

Dia bekerja sebagai jururawat.  
Dia bekerja sebagai seorang pengaturcara.

She works as a nurse.  
He works as a programmer.



# Recall that:

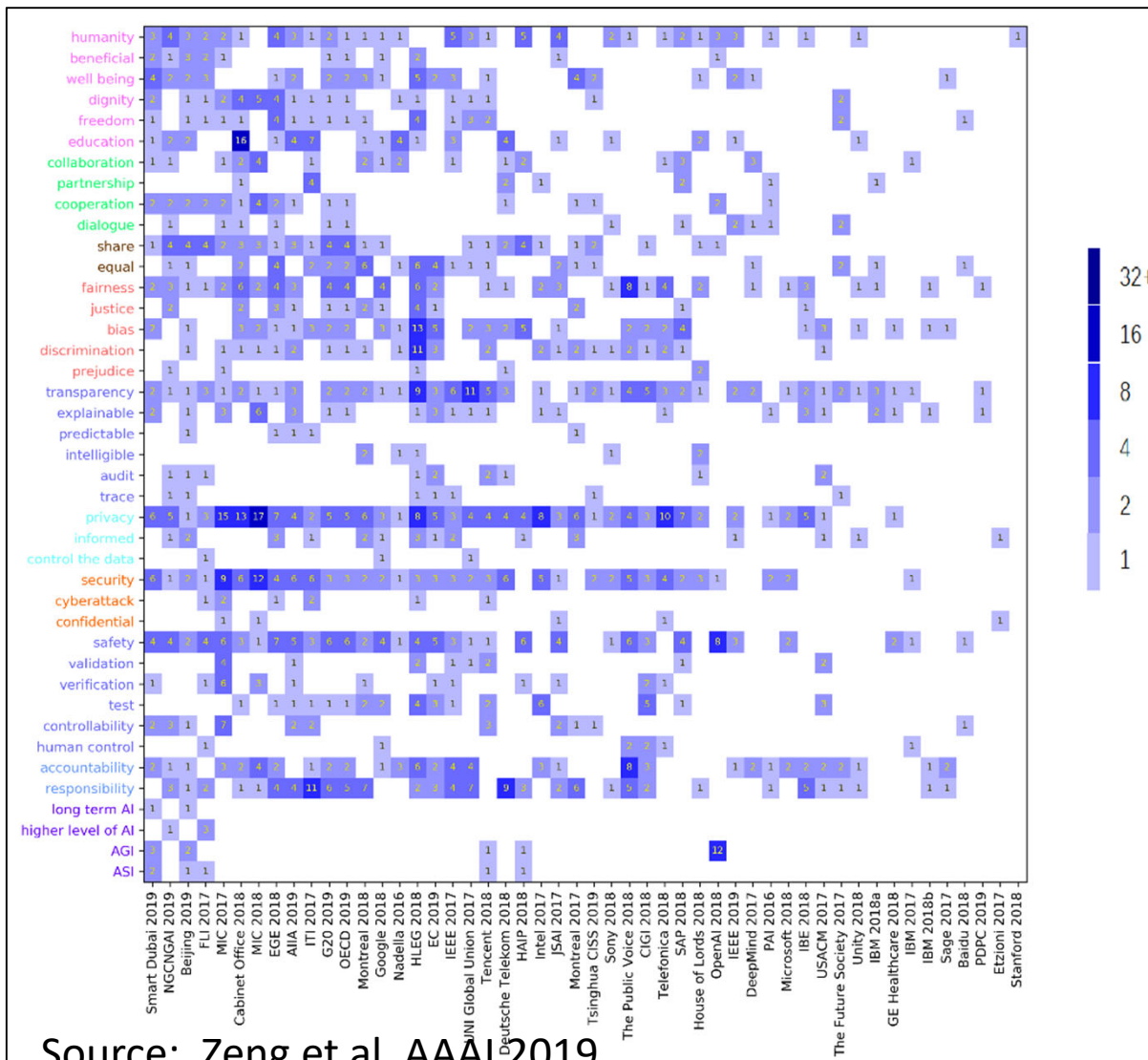
- Biases come in different forms
  - Stereotyping some things, people, groups...
  - Systematic error introduced by sampling or reporting procedures
- Data bias affects models/algorithms in applications of AI
- Ongoing research on de-biasing techniques

Source:

<https://developers.google.com/machine-learning/crash-course/fairness/evaluating-for-bias>

# AI Ethical Principles

- Around the world, governments, companies, society, stakeholders, etc. are authoring their AI ethical principles

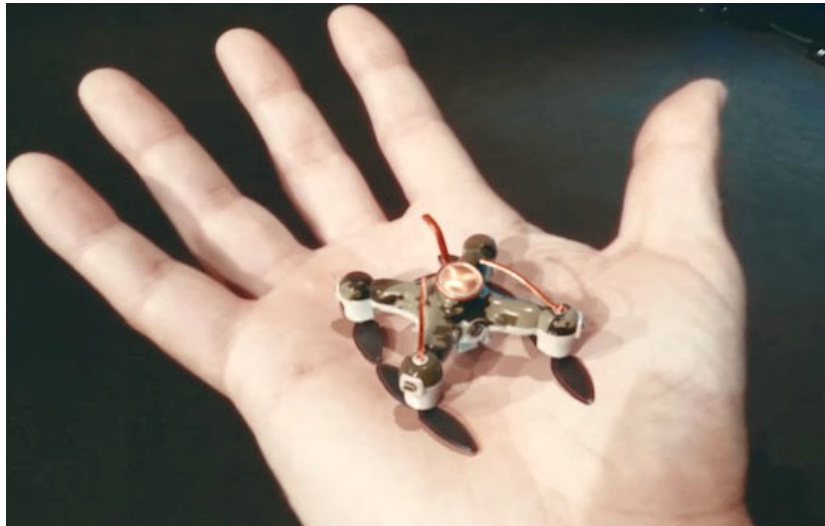


- **Growing list of principles,** including:
  - Transparency
  - Fairness and Justice
  - Beneficence
  - Responsibility
  - Privacy

Source: Zeng et al. AAAI 2019

# Example: AI can do harm

“Sci-fi” movie on AI terrorism shown at the UN Convention in 2017



Source

<https://www.youtube.com/watch?v=O-2tpwW0kmU>

Deep Fakes

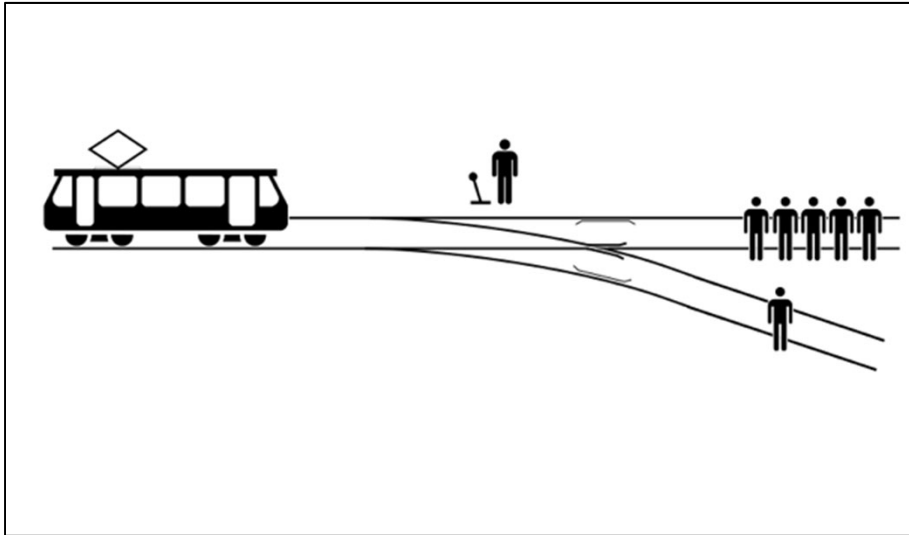


Source

<https://www.youtube.com/watch?v=cQ54GDM1eL0>

# Ethical Dilemma

- AI is making many decisions for humans autonomously



Source: <https://www.youtube.com/watch?v=ixloDYVfKA0>

Reference: MIT Moral Machines Experiment  
E. Awad, S. Dsouza, R. Kim, J. Schulz, J. Henrich, A. Shariff,  
J.-F. Bonnefon, I. Rahwan (2018). The Moral Machine  
experiment. Nature, 563, pages 59–64. DOI:  
10.1038/s41586-018-0637-6

- Classical trolley problem with ethical dilemmas applied to self-driving cars
- CUHK iCAR to facilitate discussions:

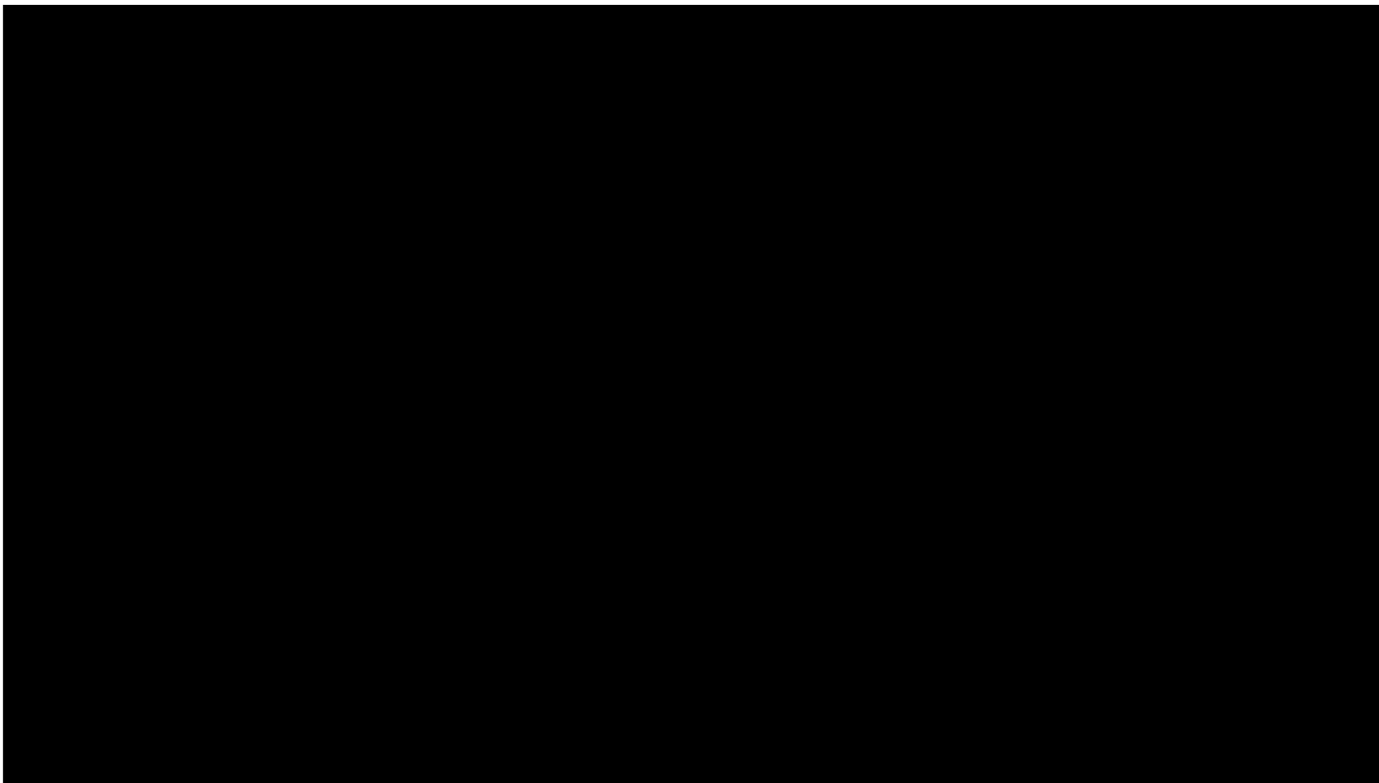
<https://youtu.be/BVrodr7PxXc>



Credits: Derek Wong, CUHK



## An Ethical Dilemma – the Trolley Problem

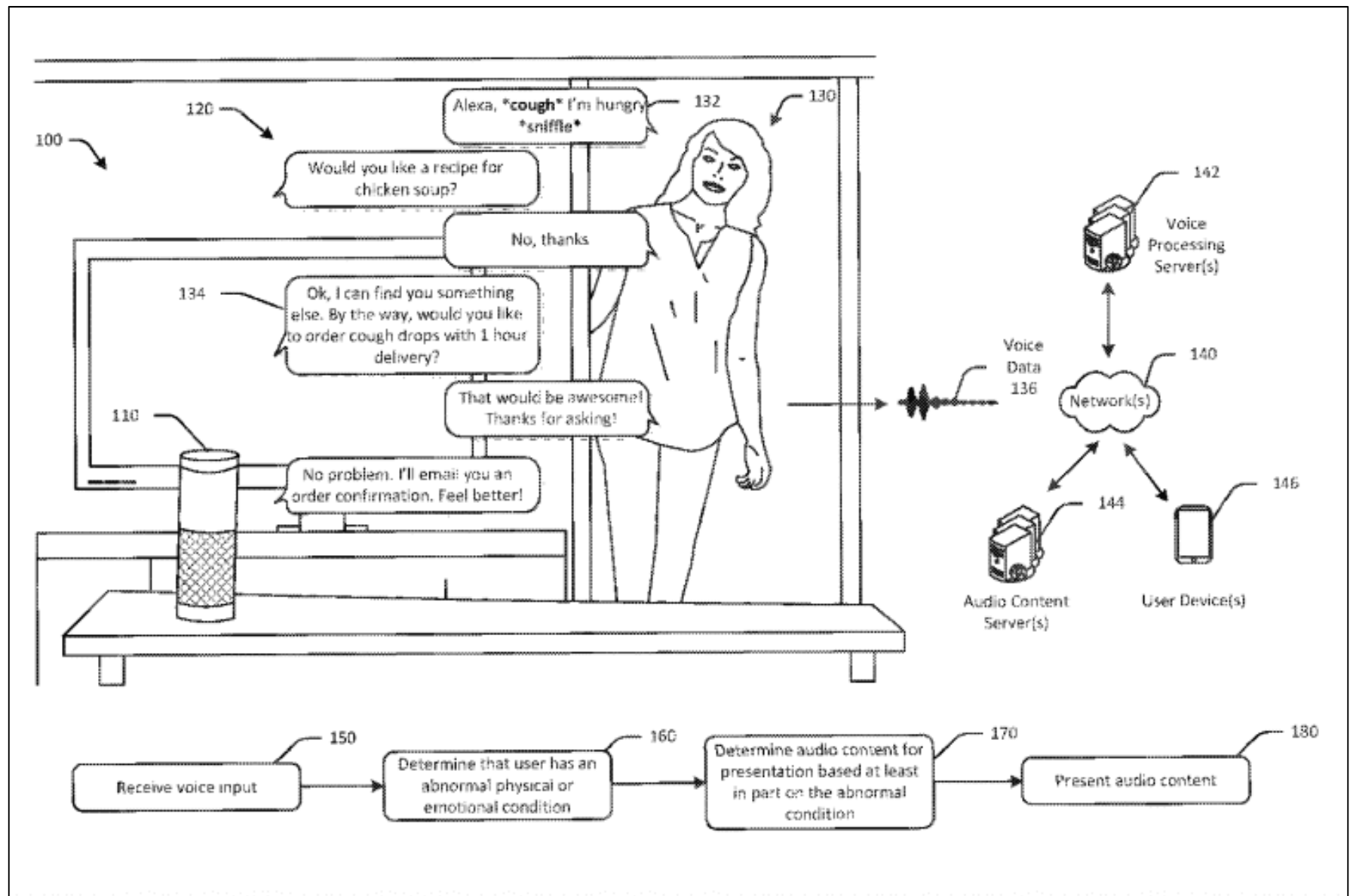


[https://www.youtube.com/watch?v=yg16u\\_bzjPE](https://www.youtube.com/watch?v=yg16u_bzjPE)

# Ethical Dilemma – Discussion

- **What should be the decision?**
  - Action versus inaction
  - Prioritize value, e.g. human>pets, women>men, young>old, fit>sickly, more lives> fewer lives, passengers>pedestrians, high social status > low social status, law abiders>law benders
- **Who should be responsible?**
  - AI programmer (who built in the decision)
  - Self-driving car manufacturer
  - Driver / other parties
  - Policy makers
  - ???

# Privacy



# Growing List of AI Ethical Principles

- Transparency: can be understood and explained
- Justice and Fairness: respect of diversity, inclusion and equality
- Beneficence: do no harm
- Responsibility: be accountable and honest
- Privacy: protect and secure sensitive data
- Etc.



# Summary

- Introduction
- Data biases
- Ethical principles