18.11.20 14:12

CSCI 101
Connecting with Computer Science
Computerised Society I

Jetic Gū

2020 Fall Semester (S3)

Announcement

- Presentations last Thursday will be moved to NEXT Monday (23 Nov 2020)
- Topic assignment for individual projects will be released later today on MS Teams

Overview

- Focus: Social Implication
- Readings: R13, R14 (Dr. Strangelove)
- Core Ideas:
    1. Computerised Society
    2. Accountability
    3. Discussion

Computerised Society

Summary

P1
Computerisation

Computerisation of Just About Everything

- Governments use computers to store information
- Banks use computers to store information
- Major Companies use Computers to store information
- I use papers and pen, but I am the minority

Review

P1
Computerisation

Computerisation of Just About Everything

- Traffic control
- Surveillance
- Air Traffic Control
- Space Exploration
- Scientific Experiment
- Criminal Record and Legal Proceedings

Review

P1
Computerisation

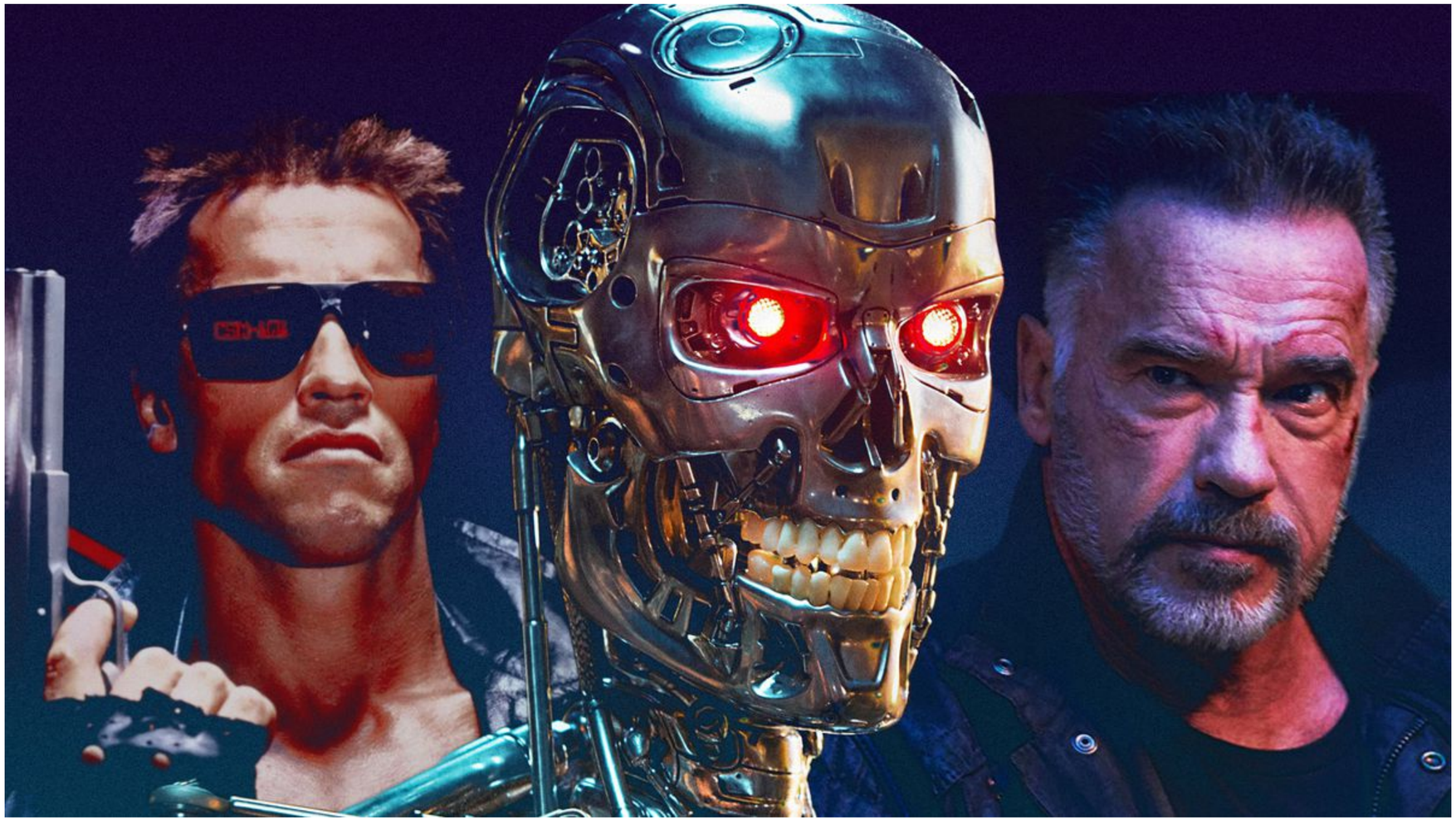
Computerisation of Just About Everything

- Military
  - Command Infrastructure
  - Automated Defence Weapon
  - Weapon control systems
  - Nuclear Weapons
  - Drones

Review

P1
Computerisation

Problems?



Review

Problems?

P1
Computerisation

Problems?

Science and Public Policy, volume 21, number 4, August 1994, pages 233-248, Beech Tree Publishing, 10 Watford Close, Guildford, Surrey GU1 2EP, England.

Computer safety

Computer-related accidental death: an empirical exploration

Donald MacKenzie

Despite widespread interest in computer system failures, there have been few systematic, empirical studies of computer-related accidents. 'Risks' reports in the Association for Computing Machinery's Software Engineering Notes provide a

JUST HOW SAFE, or how dangerous, are the computer systems on which lives depend? How many lives have been lost through failures of such systems? What are the causes of such accidents?

Although there is a large literature on computer

Review

1. MacKenzie, 1994. *Computer-Related Accidental Death: An Empirical Exploration*

P1
Computerisation

Computer Caused Deaths

- Physical Cause
- Software Cause
- Human Computer Interaction Prc
  - Medical
  - Military
  - Air
  - Robot Related
  - Automated Plants

Robot-related

1978-87	10	Japan	Workers struck during repair, maintenance, installation or adjustment of robots	Workers entered envelope of powered-up robots; in some cases, deficiencies in training and absence of fences	ive
1984	1	USA	Heart failure after being pinned by robot	Worker entered envelope of powered-up robot	ırning sion;

Involving other automated plant

1979	1	USA	Worker struck by automated vehicle in computerised storage facility	Absence of audible warning; inadequate training; production pressure	tuation
1983-88	13	France	Accidents to operators/ installers/repairers of automated plant	Insufficient individual detail given in source	tem; ıs.
1988	1	UK	Maintenance electrician killed by unexpected movement of automatic hoist	Disconnection of proximity switch, sent signal to controller; machine not isolated	npass ion al
1989	1	UK	Setter/operator killed by palletiser	Machine cycled when boxes interrupting photoelectric beam removed; transfer table not isolated	aft ın

1. MacKenzie, 1994. *Computer-Related Accidental Death: An Empirical Exploration*

P1
Computerisation

Tesla Case

- Autopilot fails all the time
  - Even when it is trying to parallel park🤷‍♂️

Review

P1
Computerisation

So what are we talking about today?

- We know computers have infiltrated our everyday lives
- We know computers are controlling very dangerous/life-critical machines and equipments out there
- How on Earth may we be safe???

Concept

Accountability

and Blame, and Responsibility

Summary

P2
Accountability

Blame, Responsibility, Accountability

- **Blame**
- **Responsibility**
- **Accountability**

Concept

P2
Accountability

Blame, Responsibility, Accountability

- When bad things happen
  - **Blame**
    - Who did wrong
  - **Responsibility**
    - Who gets the punishment
  - **Accountability**
    - Who gets to clean up the mess

Concept

P2
Accountability

When a computer fails, what next?

- Who takes the blame?
  - User? Software Company? Operator? Government?
- Who should be responsible?
  - User? Software Company? Operator? Government?
- Who should be made accountable?
  - User? Software Company? Operator? Government?

Concept

P2
Accountability

How do we establish?

- Blame
- Responsibility
- Accountability

Concept

P2
Accountability

Blame?

- Case 0: driver was not using autopilot when he drove over a pedestrian, killing the pedestrian instantly.
- Case 1: driver was not using autopilot when he drove over a pedestrian, killing the pedestrian. But the driver's vision was blocked by another illegally parked Tesla.
- Case 2: driver was found sleeping in a Tesla car with Autopilot turned on, the car was going for 160kmph when stopped by RCMP.
- Case 3: driver was found playing video games when Tesla car in Autopilot mode crashed into the exit barrier and was killed by impact.
- Case 4: during Tesla's autonomous car trial, a pedestrian woman was missed by the software and killed, while the Human participant was distracted.

Concept

P2
Accountability

Responsibility? Accountability?

- Case 0: driver was not using autopilot when he drove over a pedestrian, killing the pedestrian instantly.
- Case 1: driver was not using autopilot when he drove over a pedestrian, killing the pedestrian. But the driver's vision was blocked by another illegally parked Tesla.
- Case 2: driver was found sleeping in a Tesla car with Autopilot turned on, the car was going for 160kmph when stopped by RCMP.
- Case 3: driver was found playing video games when Tesla car in Autopilot mode crashed into the exit barrier and was killed by impact.
- Case 4: during Tesla's autonomous car trial, a pedestrian woman was missed by the software and killed, while the Human participant was distracted.

Concept

P2
Accountability

It is easy to blame, but extremely hard to remove the problem

- Software goes wrong
  - Blame the operator
  - Blame the developer
  - Blame the company
  - Blame the computer
  - Blame the society
  - Blame parents for giving birth to you

Concept

Problem?

- Hardware/Software flaws are not intentional
- Discovering flaws can take extremely long period of time
  - Vaccines typically 5 years to develop

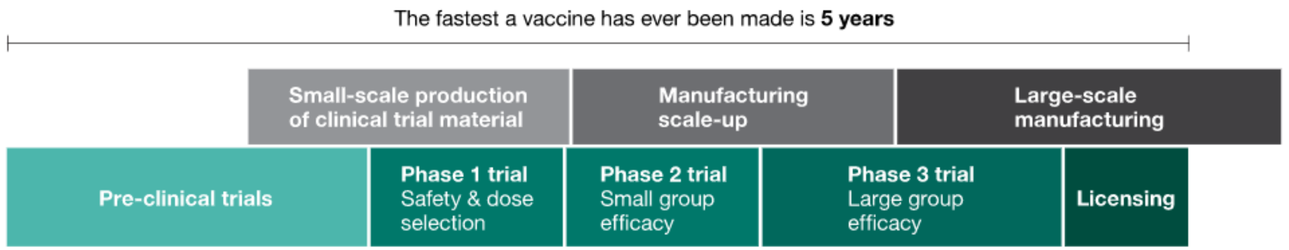
P2
Accountability

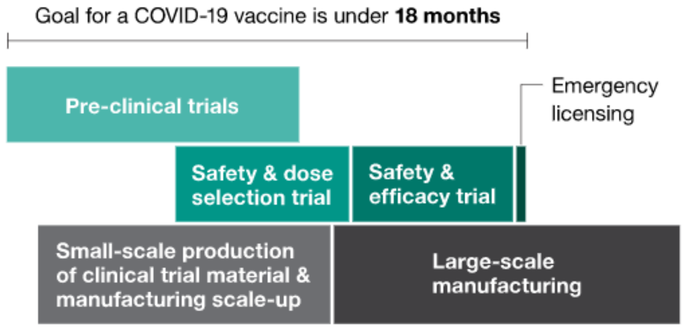
Problem?

- Hardware/So
- Discovering f
  - Vaccines ty

How soon will a vaccine be ready?

All vaccines go through a rigorous process to make sure they're safe and effective.





Governments will need to expedite their usual drug approval processes in order to deliver the vaccine to over 7 billion people quickly.

Source: NEJM (2020)

Concept

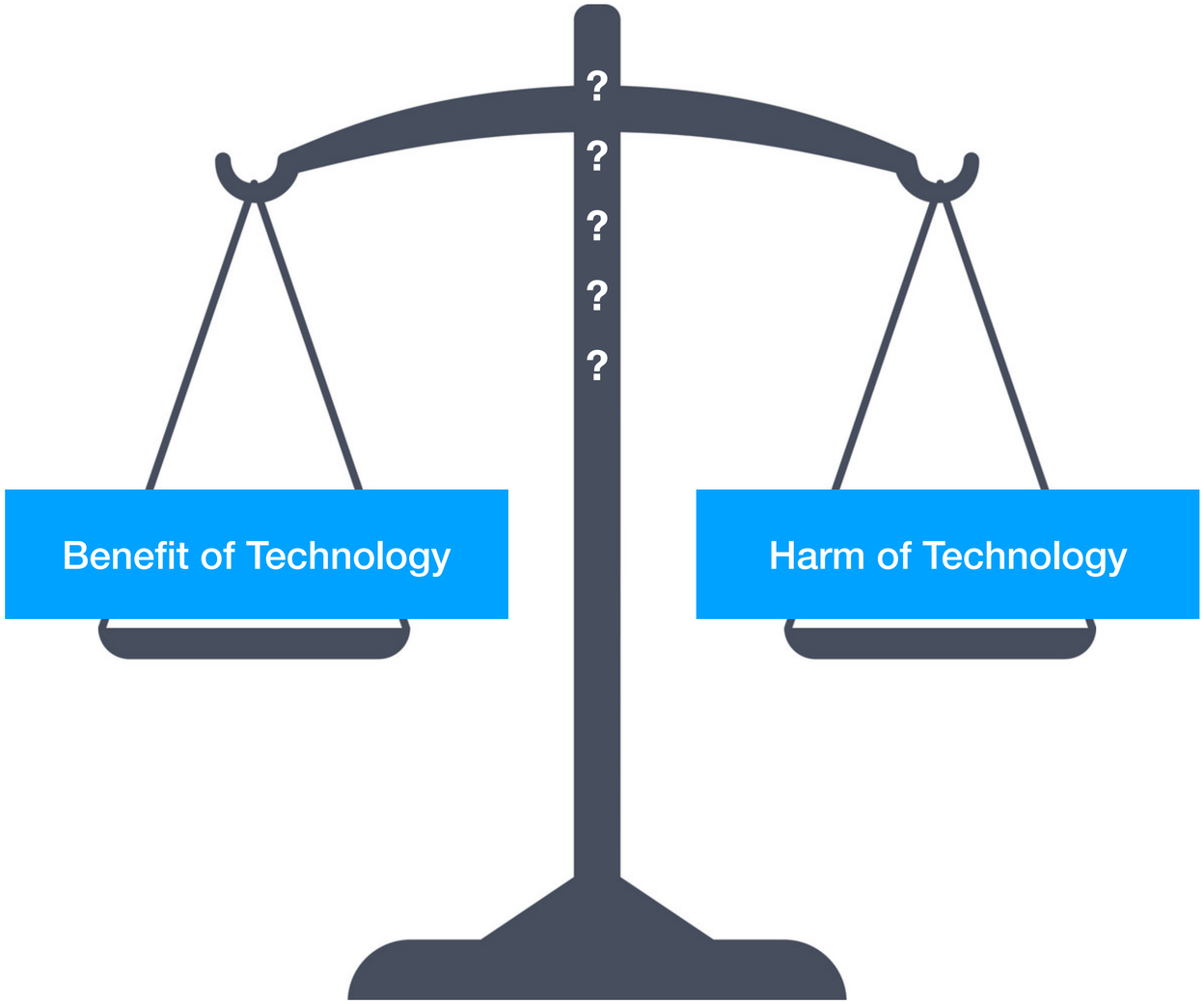
Problem?

- Computers make much less mistakes than human
  - It is illogical to blame the computers
- Hardware/Software bugs are not intentional
- Discovering flaws can take extremely long period of time
  - Vaccines typically 5 years to develop
- Who can solve the problem?
  - Does eliminating the technology solve the problem?

Concept

P2
Accountability

Problem?



Concept

P2
Accountability

Discuss!

- Autonomous Vehicles
- Nuclear weapons
- Genetically modified food
- Cloning technology
- Military Drones, Licensed to Kill
- Artificial Intelligence

Discuss

P2
Accountability

Discuss!

- What do you think, is the responsibility of Computer People?
  - Computers enables anyone to create, and spread their creations
- What should you develop?
- What should you not?

Discuss