Some issues in some term paper topics

12 September 2017
Self-driving cars

How to assure software doesn’t cause an accident
Assuring safe handoff to humans
Making life and death decisions
Control of the US National Air Space

How to be sure it works—always!
Backup systems that really work
Security from hacking
  • E.g. GPS spoofing
High-Speed stock market trading

Is this even ethical?

Assuring trading systems don’t cause crashes
  • They already have (flash crashes)
Electronic Voting and Elections

Assuring voting machines don’t skim votes

Assuring robust processes
  • E.g. protecting voting rolls from hacks
Electronic Medical devices (e.g. cardiac pacemakers)

How to be sure they will work—always

Protecting them from hackers
The Internet of Things (IoT)

Protecting people’s privacy

Protecting them from hackers
  • E.g. recruitment into botnets
  • Whose job is this?
Robot Ethics

What is ethical behavior?
How to assure it?
Smart structures (homes, bridges, roads, buildings)

- Privacy issues
- Safety issues
- Robustness issues
Unmanned Air Vehicles (Drones)

Privacy issues
Collision avoidance (not intended collision)
Spacecraft software

Must work the first time
No way to really test it
Electronic Healthcare Records

Life critical software
Protection from hacking
The right to be forgotten

Privacy issues

Encoding this in law?
Biased and Discriminatory Software

How to tell if software is biased
Intentional or not? Does it matter?
Fake News

How do we prevent it? Should we?