



Artificial Intelligence and Legal Liability

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Who is liable
and why?

A recent issue of *IEEE Spectrum* posed the following question:

- “It is the year 2023, and for the first time, a self-driving car navigating city streets strikes and kills a pedestrian. A lawsuit is sure to follow. But exactly which laws will apply? No-one knows.”

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Who is liable and why?

Possible liable parties:

- Anyone in the driving seat of the car who could have taken control
- The manufacturer of the car
- The manufacturer of the self-driving sensors
- The designer of the 'artificially intelligent' self-driving software
- The programmer of the self-driving software

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Added concern: Stifling Innovation



LAWS THAT PREVENT INNOVATION
ARE UNDESIRABLE



BOTH PATENT LAW AND
COPYRIGHT LAW ARE DESIGNED
TO *ENCOURAGE* KNOWLEDGE
SHARING

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Another concern: Relative Risk



If there are two risks, one may be significantly greater than the other



Shouldn't such decisions be made by the driver?

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Three Legal Models

Perpetrator-via-another

Natural-probable-consequence

Direct liability:

- Strict liability e.g. speeding – no intention required
- Negligence e.g. not slowing down when there's snow and ice on the road – not doing what a 'reasonable person' would have done
- Intentional – knowledge or information of consequences required e.g. deliberately causing damage/injury with a car

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Who is liable under each model?



Perpetrator-via-another

AI is an innocent agent. Liability falls on the designer/programmer of the AI or the sensors

Part of the AI intended for good is activated/not activated inappropriately



Natural-probable-consequence

Liability falls on either the designer/programmer (if activation should not have happened); or the activator (user?); or the health and safety system that should have prevented inappropriate activation

Japanese robot example



Direct liability:

Strict liability – AI is liable

Negligence – did the programmer/designer take enough account of what a 'reasonable person' would do according to context?

Intentional – Designer/programmer liable

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Possible defences for an AI system



Computer virus

Similar to intoxication or coercion defences for humans?



Malfunction

Similar to insanity defence?



Criminal cases must be 'beyond reasonable doubt'

So defences are important
Denial of service by teenager

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Product or a service?



There's also the question of whether an AI system is legally a product or a service



Makes a big difference in (US) lawsuits
– product design damages are usually much larger

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The underlying problem: limitations of AI



Example: the fault wasn't in the AI, it was in the sensors not distinguishing between a hedge and a lorry

And the AI had no way of reasoning about the difference



It's a well-known problem for AI systems that they don't function well where general knowledge is required



Humans usually have some kind of fall-back reasoning

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'Solutions' to lack of general knowledge



Warn the user



Stop the AI doing anything if it has insufficient info



Sell the AI as a 'helper' where the user is officially in control



Not much use for self-driving cars...

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Task



Determine who was legally liable for the incident described below?



How could such incidents be avoided in future?



You may assign legal liability to more than one individual/group if you wish.



if so, please indicate who has most and who has least liability.

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Description Of Incident



The information about the incident is presented in a sequence (Level 1 through to Level 4).



You should discuss the conclusions you would draw from each successive level.

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Level 1 information



AI System:

The program gets inputs from the LIDAR sensors, the radar sensors and the GPS navigation system. The GPS tells the car what the speed limit is; whether there are locations where caution is needed, such as Intersections; and which lane to be in in order to make the required turns. The LIDAR sensors detect the environment to tell the AI whether there are any unexpected obstacles.



Sensors:

Our LIDAR sensors provide accurate 3D information on the surrounding environment. They can detect the size, shape, speed and direction of objects within range.



Cyclist and Car:

The woman was pushing her bicycle across a seven-lane road. She wasn't at a pedestrian crossing. The stretch of road is unlit. She wasn't wearing reflective clothing.



Operator(s):

There was a human driver in the car ready to take over if necessary.

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Level 2 information



AI System:

The LIDAR sensors detect objects in motion as well as static objects. The AI calculates the speed and direction to determine possible collisions



Sensors:

They work by sending out pulses of laser light, so they're not affected by darkness and not very much by fog, rain or snow.



Cyclist and Car:

The car was travelling at 43mph, within the speed limit of 45 mph.



Operator(s):

Post-crash in-car video shows the human driver looking down at the self-driving interface rather than at the road for 3s before the crash.

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Level 3 information



AI System: The AI does not respond to every object detected by LIDAR. If it did the car would be forever slowing down for plastic bags, leaves, birds or other objects being blown across the road. The operator can set the bar for how often objects that don't resemble human beings should be ignored.



Cyclist and Car:

There were no other cars nearby



Sensors:

They aren't very good at very close range work (for parking) so the car also has radar sensors for that.



Operator(s):

Until a few weeks before the crash, there had been two operators in each car to double the chances of one being alert.

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Level 4 information



AI System:

The AI system makes very few mistakes. Most of those are due to inaccuracies in the GPS.



Sensors:

The sensors on the car that crashed were working correctly.



Cyclist and Car:

The cyclist walked into the area lit by the car's headlights approximately 0.8 seconds before impact.



Operator(s):

The operator had disabled the emergency braking system while the car was under computer control. Only the human driver could make an emergency stop.

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Uber Accident (March 2018)



first recorded case of a pedestrian accident involving a self-driving (autonomous) car



collision occurred late in the evening of March 18, 2018



pushing a bicycle across a four-lane road in Tempe, Arizona



struck by an Uber test vehicle

- operating in self-drive mode
- human safety backup driver sitting in the driving seat



https://www.youtube.com/watch?v=XTXd5bfX_GI

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Summary



If an AI system makes a mistake, who is liable?



Depends on the law of the offence...

Strict liability
Negligence
Knowledge or information required



And on whether it's a product or a service...



But deeper issue is that AI doesn't do well at general knowledge or understanding context



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