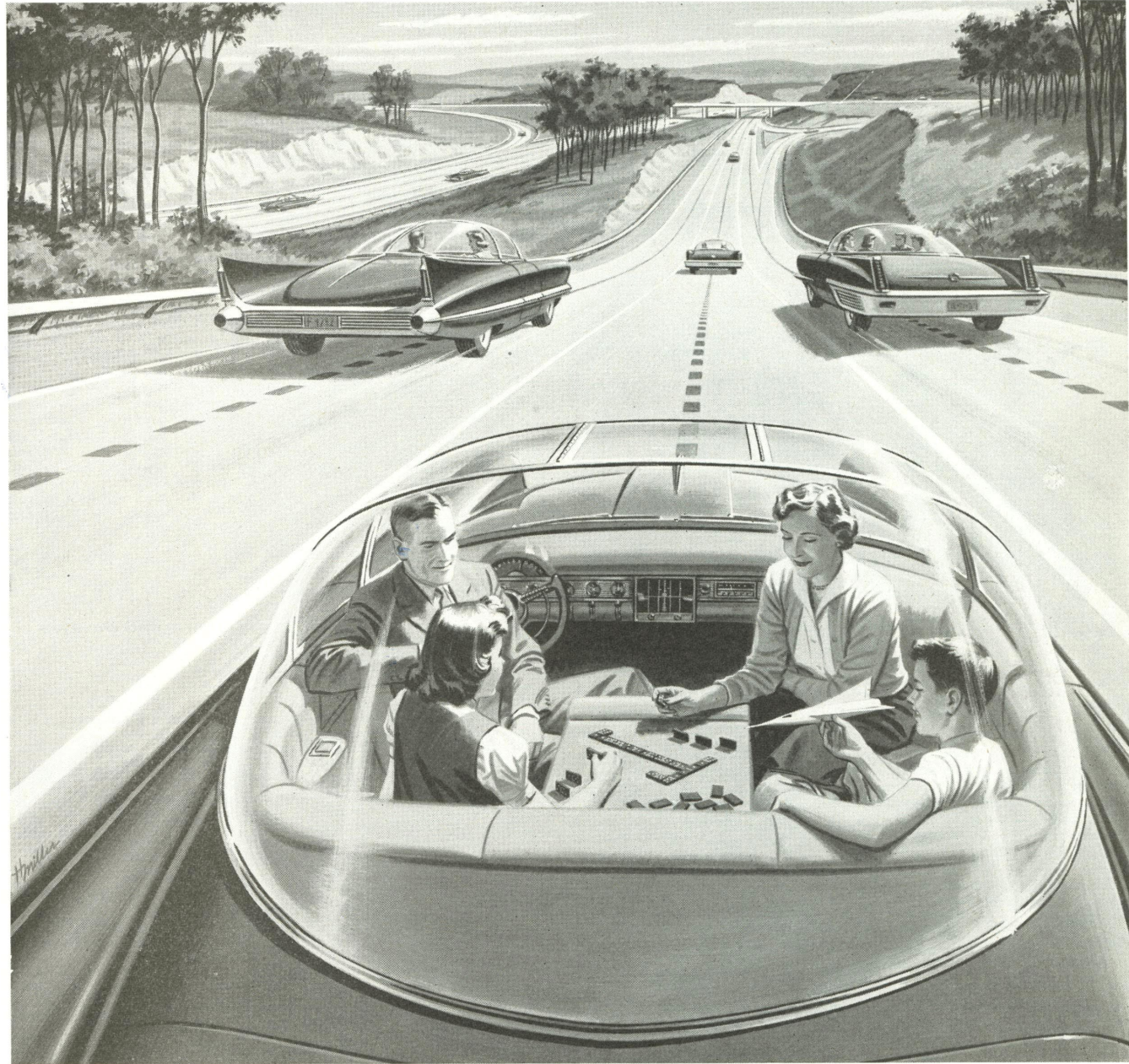


# The Friendly Neighbourhood Robots



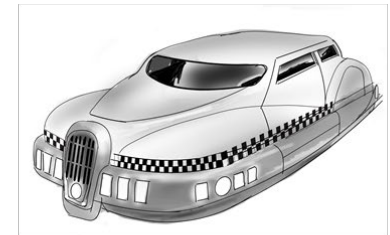
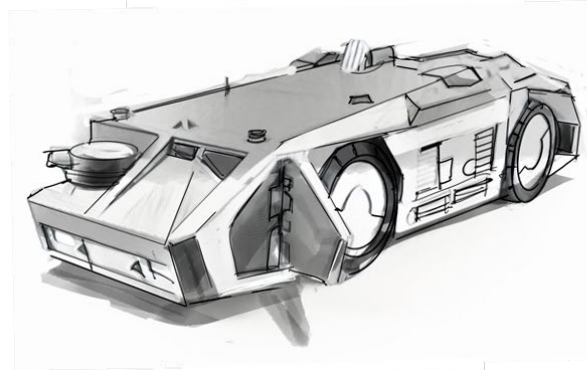
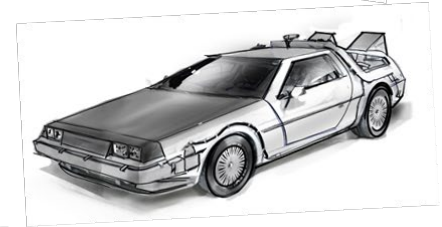
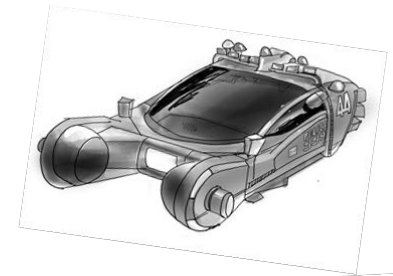
Prof. Joseph Giacomin

# Future Autonomous Vehicles As Conceived Circa 1960



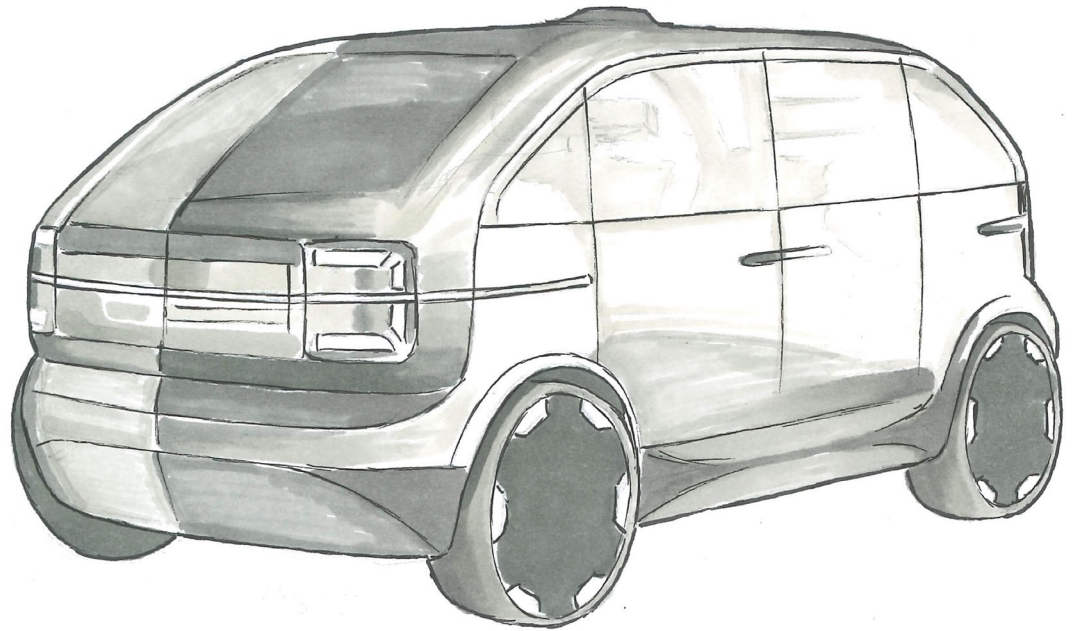
**ELECTRICITY MAY BE THE DRIVER.** One day your car may speed along an electric super-highway, its speed and steering automatically controlled by electronic devices embedded in the road. Travel will be more enjoyable. Highways will be made safe—by electricity! No traffic jams . . . no collisions . . . no driver fatigue.

# Semi-Autonomous And Autonomous Vehicles In Science Fiction



# Autonomous Vehicles Circa 2022

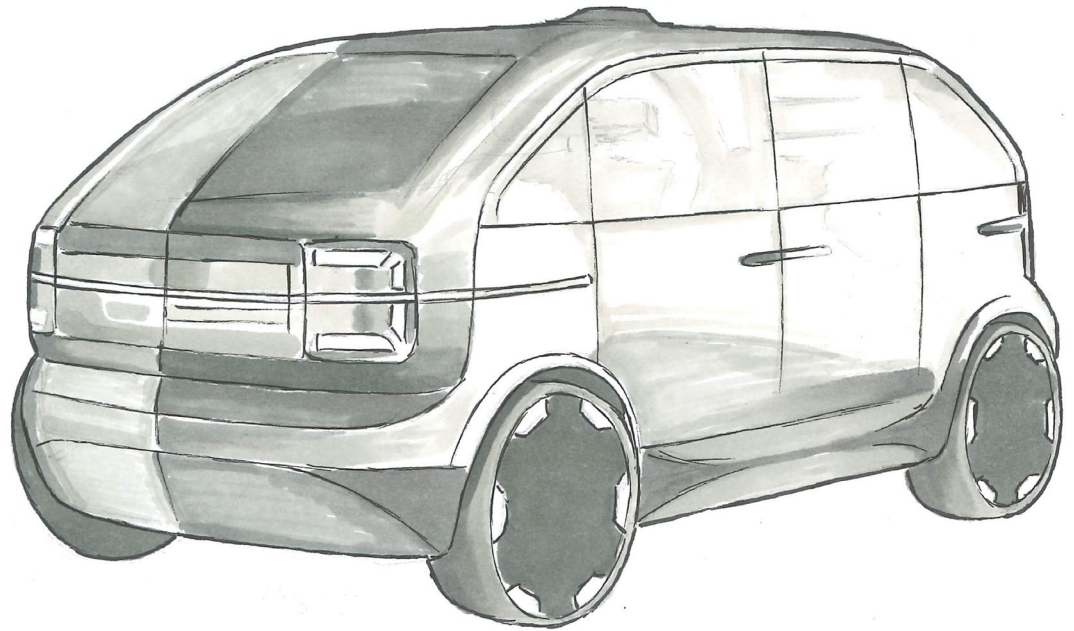




## Friendly Neighbourhood Robots

A road vehicle can be considered a friendly neighbourhood robot if it transports people or goods autonomously without the intervention of humans under complex road conditions and complex traffic conditions for extended periods of time.

Giacomin, J. 2024, *Future Autonomous Road Vehicles*, Routledge, Abingdon, Oxon, UK.



## Friendly Neighbourhood Robots

Autonomous, independent and responsible. The disruptively different forms of road transport will carry a premium price tag, will require a highly efficient business model and will require careful customer-centric design to get the sums to add up.

Giacomin, J. 2024, Future Autonomous Road Vehicles, Routledge, Abingdon, Oxon, UK.



# Anthropomorphism

Contoured body shapes stimulate female associations while squared body shapes stimulate male associations.

Movement stimulates the human anthropomorphising tendency.

Human-like names stimulate the human anthropomorphising tendency.

Human-like speech stimulates the human anthropomorphising tendency.



Mechanical Tool

or

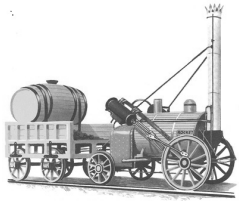


Anthropomorphised Machine

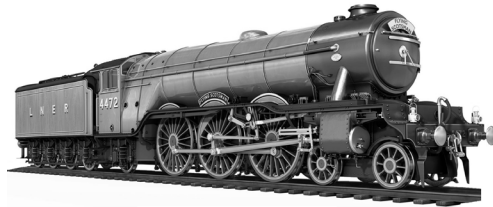
## Anthropomorphism

For robots there is a need to decide if the artefact should be considered a mechanical tool or instead an anthropomorphised machine.

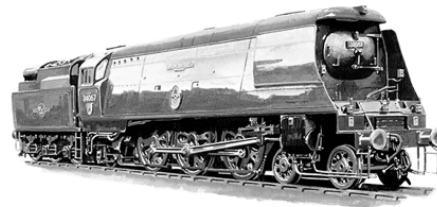




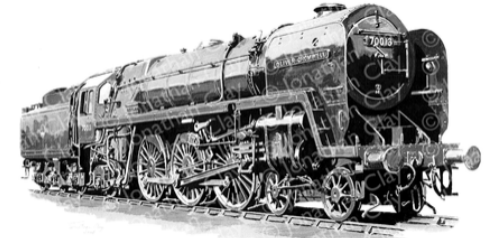
Rocket (1829)



Flying Scotsman (1924)



Battle Of Britain (1945)



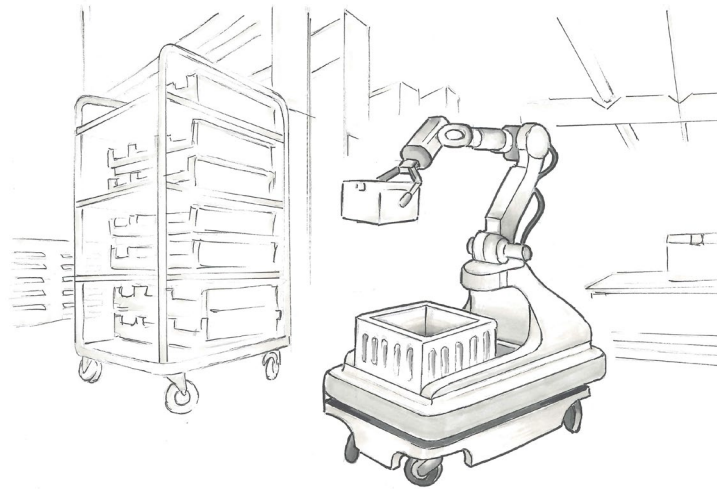
Britannia (1951)

## Name

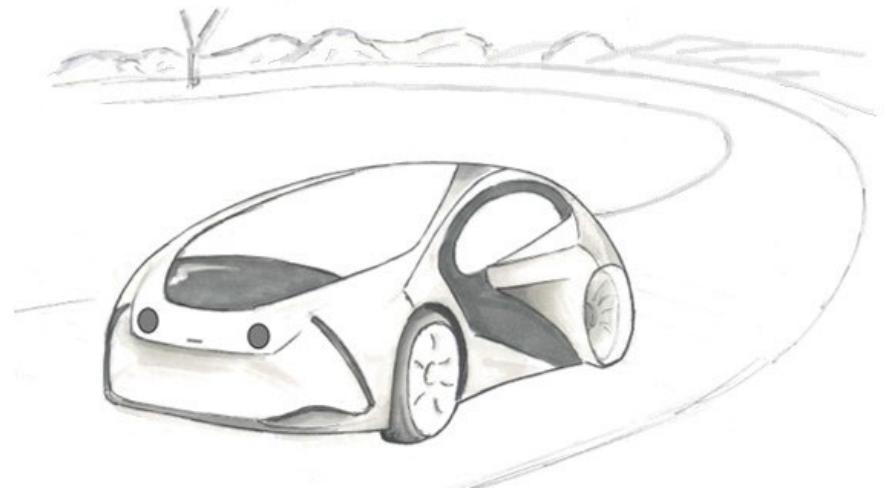
There is historical evidence of a general law of name development.

Early naming tends to be based on “essential characteristics” which help describe the artefact and which help to introduce it to people.

Later naming tends to be more commemorative or opportunistic in nature, associating the artefact with famous locations, people, events or values.



If a robot is to be viewed as a mechanical tool, then words such as “box”, “connector”, “cube”, “mover”, “pod”, “shuttle” or “transporter” might prove helpful elements of the name.



If a robot is to be viewed as an anthropomorphised machine, then words such as “agent”, “assistant”, “doctor”, “guide”, “entertainer”, “specialist” or “valet” might prove helpful elements of the name.

## Name

Giacomin, J. 2022, *Humans And Autonomous Vehicles*, Routledge, Abingdon, Oxon, UK.

## Function



Some things need doing, with or without aesthetic or semiotic content.

## Ritual



Some actions are performed for their aesthetic and semiotic content. The motions and actions send messages.

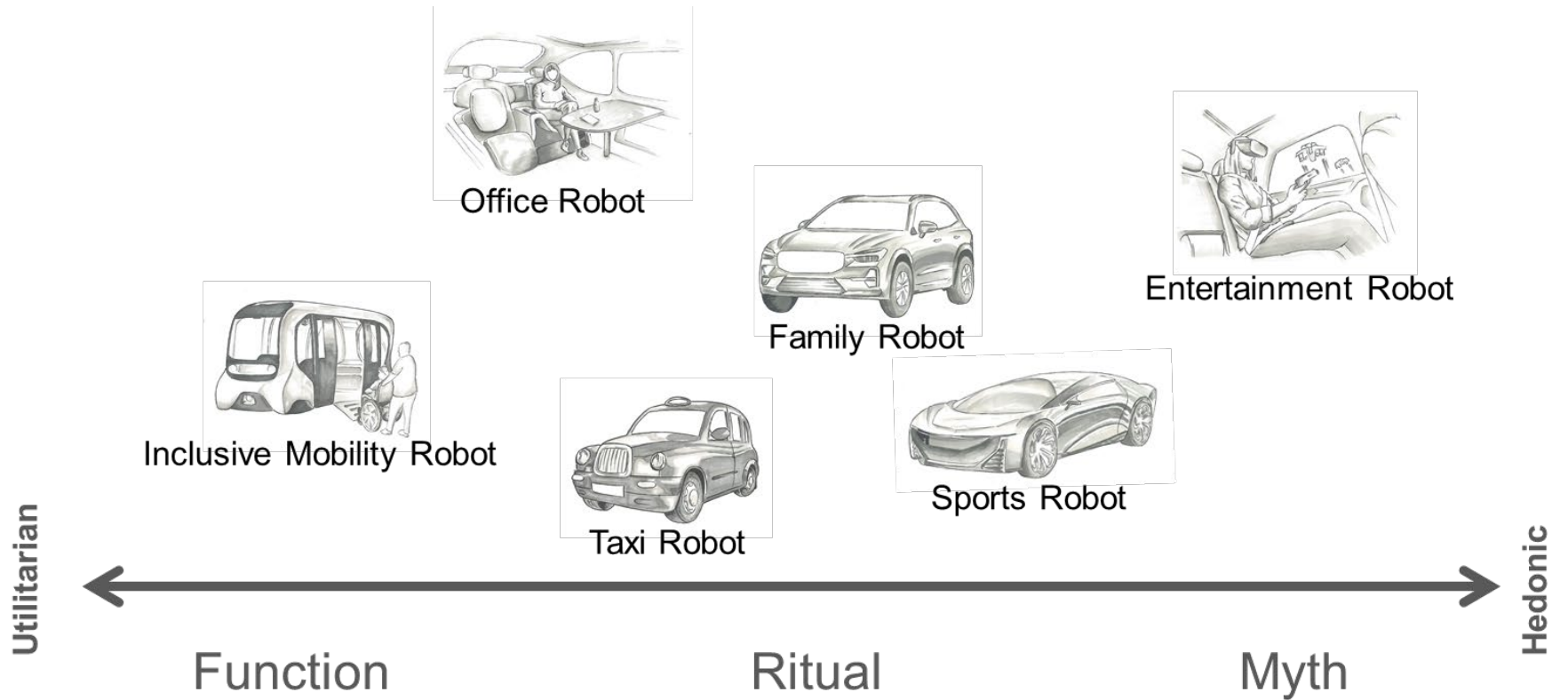
## Myth



Some things are pure aesthetic or semiotic. Motions or actions may not be necessary.

# Meaning

Giacomin, J. 2017, What is Design for Meaning?, Journal Of Design, Business & Society, Vol. 3, No. 2, pp.167-190.



# Meaning

Giacomin, J. 2024, Future Autonomous Road Vehicles, Routledge, Abingdon, Oxon, UK.



# Metaphor

A complex thing or concept is described in terms of a simpler thing or concept in order to highlight key characteristics. It provides a focal point for design.

Lakoff, G. and Johnson, M. 1980, *Metaphors We Live By*,  
The University of Chicago Press, Chicago, Illinois, USA



Company Car



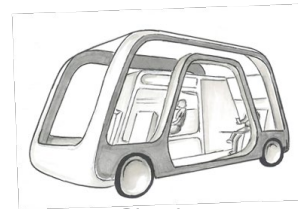
Rental Car



Taxi



Family Car



Shuttle



Mobile Office



Specialist Shuttle



Entertainment Centre

# Metaphor

The metaphors for human driven road vehicles and friendly neighbourhood robots are different.

# Interactions

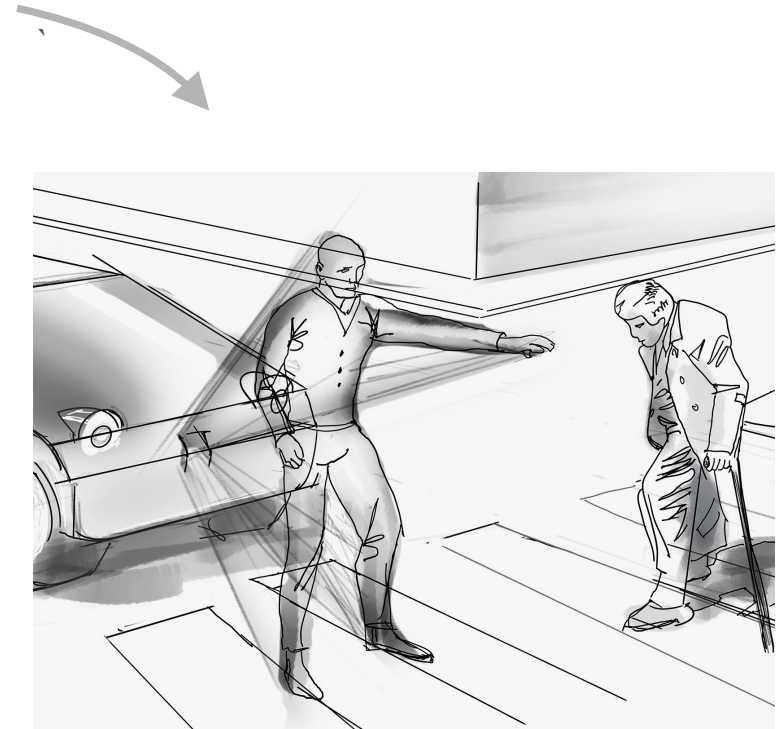
Instructing: where users issue instructions to a system.

Conversing: where users have a dialog with a system.

Manipulating: where users interact with objects in a physical or virtual space by manipulating them.

Exploring: where users move through a physical environment or a virtual environment.

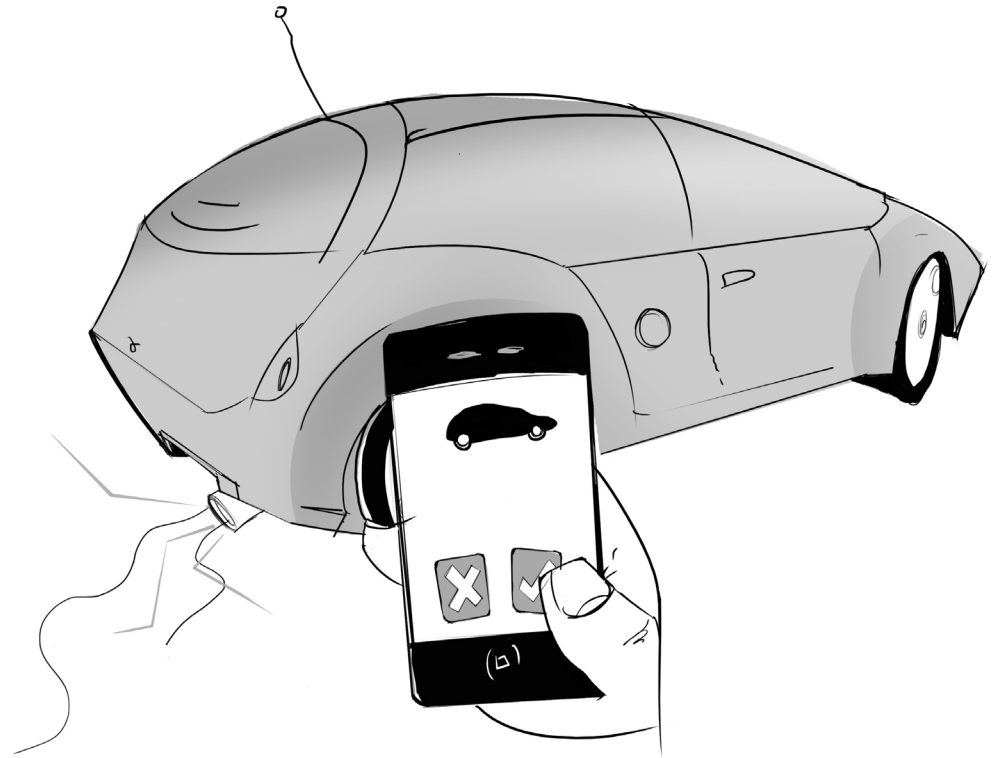
Responding: where the system initiates the interaction and the user chooses whether or not to respond.



## Interactions

The interactions between humans and friendly neighbourhood robots will be different from those between humans and human driven road vehicles.





## Ethics

The delegation of the decision making renders the friendly neighbourhood robots challenging to design from the point of view of ethics.

Existing automotive standards of crashworthiness, ride comfort, thermal comfort and other physical characteristics may require minor updating but matters of information, navigation and behaviour will require new criteria and new standards.

# Ethics

## Human Dignity

The emotional needs of humans are always to be respected.

The human's right to privacy shall always be respected to the greatest extent consistent with reasonable design objectives.

Human frailty is always to be respected, both physical and psychological.

## Design

Maximal, reasonable transparency in the programming of robotic systems is required.

Predictability in robotic behaviour is desirable.

Trustworthy system design principles are required across all aspects of a robot's operation, for both hardware and software design, and for any data processing on or off the platform.

Real-time status indicators should be provided to users to the greatest extent consistent with reasonable design objectives.

Obvious opt-out mechanisms (kill switches) are required to the greatest extent consistent with reasonable design objectives.

## Legal

All relevant laws and regulations concerning individuals' rights and protections (e.g., FDA, HIPPA, and FTC) are to be respected.

A robot's decision paths must be re-constructible for the purposes of litigation and dispute resolution.

Human informed consent to HRI is to be facilitated to the greatest extent possible consistent with reasonable design objectives.

## Social

Wizard-of-Oz should be employed as judiciously and carefully as possible, and should aim to avoid Turing deceptions.

The tendency for humans to form attachments to and anthropomorphise robots should be carefully considered during design.

Humanoid morphology and functionality is permitted only to the extent necessary for the achievement of reasonable design objectives.

Avoid racist, sexist, and ableist morphologies and behaviours in robot design.

Riek, L. and Howard, D. 2014, A code of ethics for the human-robot interaction profession, Proceedings Of We Robot, April 4th-5th, University Of Miami School Of Law, Miami, Florida, USA.

# Friendly Neighbourhood Robots

Anthropomorphism: None / Moderate / Extensive

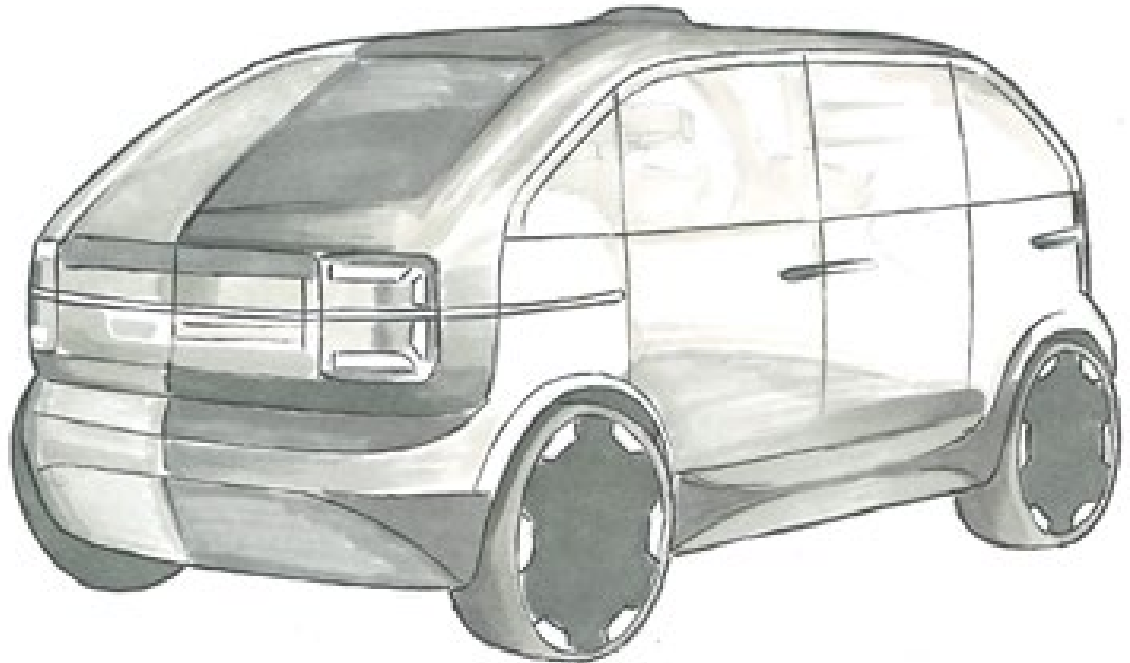
Name: Technical / Hybrid / Humanoid

Meaning: Functional / Ritualistic / Mythical

Metaphor: Automotive / Hybrid / Autonomous

Interactions: Automotive / Hybrid / Autonomous

Ethical Concerns: None / Moderate / Extensive



# Thank you.

