IXD Midterm

Xiaoyun Yu Jun, 2022

Q6

i.

From the human's side:

Eyes – look at side mirrors; look at rearview mirror; watch dashboard

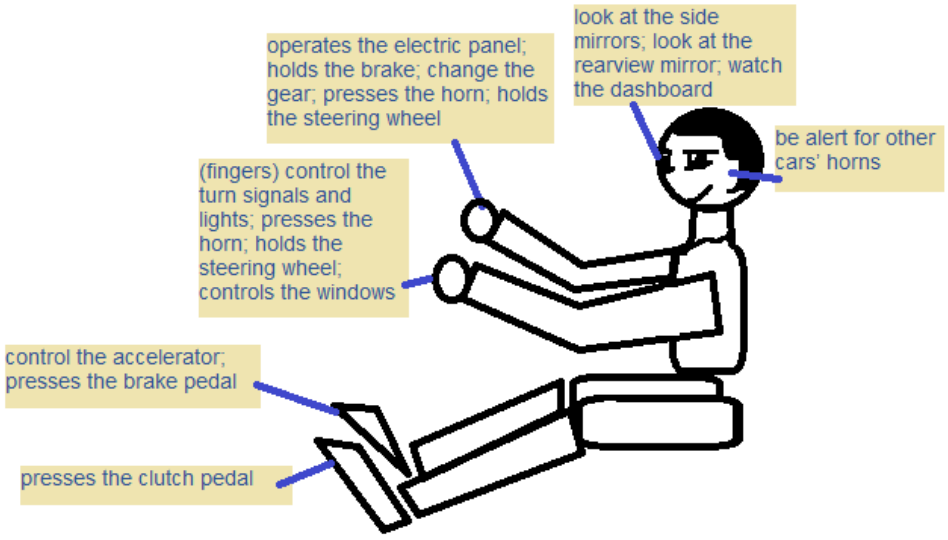
Left hand – (fingers) control the turning signals and lights; presses the horn; holds the steering wheel; controls the windows

Right hand – operates the electric panel; holds the brake; change the gear; presses the horn; holds the steering wheel

Left foot – presses the clutch pedal

Right foot – controls the accelerator; presses the brake pedal

Ears – be aleart for other cars' horns



From the car's side:

Rear-view mirror – eyes

Windows – eyes, left hand

Side-view mirrors – eyes

Speedometer – eyes

Horn – hands

Steering wheel - hands

Lights – left hand

Brake pedal – right foot

Accelerator – right foot

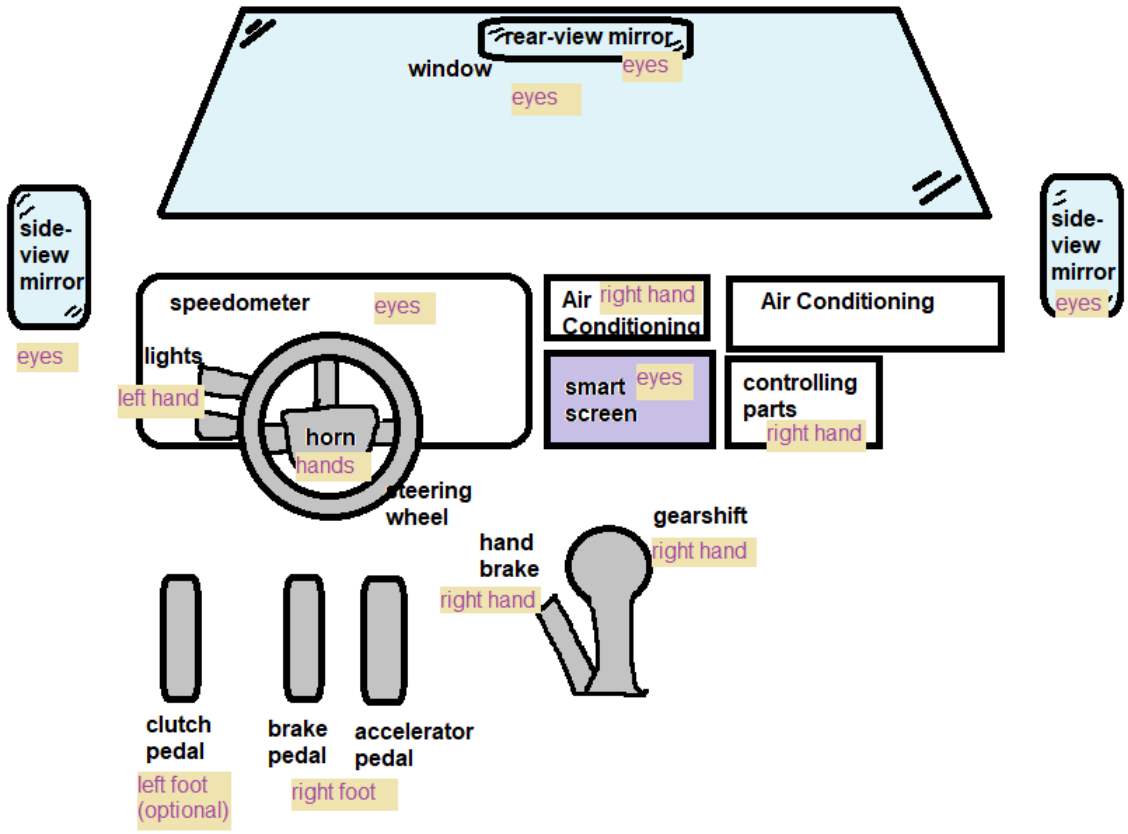
Clutch pedal – left foot

Smart screen – eyes, right hand

Controlling parts – right hand

Gear shift – right hand

Hand brake – right hand



Parts in a Car Controlled by Human Body Parts

Self-driving car model:

Key functionalities	Technologies
detect the distance of all the key objects in front, rear, both sides of the car	feature extraction from videos/images; tracking of one thing
detect all living things	360 degree thermo-cameras; feature extraction; tracking
(detect the age of any human, whether he/she has disabilities or not)	feature extraction; tracking
detect all cars surrounding it	feature extraction; tracking
detect a human from only parts of him/her	identification of a feature; inference ability; tracking
control the front lights and rear lights to other cars and pedestrians	
can turn left or right	controlling the directions of tyres
can horn whenever: (1) the pedestrians have not noticed us; (2) the car in front is stuck or moving slowly	controlling the sound system; tracking
provide obvious hint for driver if he wants to	sound hint, visual hint; full human manual driving mode

control the car and has shifted the driving mode to ‘manual’	functionalities, similar to common cars
can brake when: in the moving direction, a thing will be too near in very short amount of time	controlling the tyres (brake); detection of distance; tracking; monitoring
can accelerate when: (1) start off the car; (2) there is no dangerous things in front; (3) on a highway	controlling the tyres

ii. Language:

My model has simple words that can be easily understood by end users but there are indeed some jargons, like ‘feature’, ‘inference’, etc. that may prevent users from full acceptance of my model.

Visuals:

There are graphs which show the relationships between functionalities of a car and human body parts. But if the user is unacquainted with automobile terms, then the model fails. I can explore more types of visuals: icons, statistical plots, typography, etc. Also, I should improve the colour usage.

Space and proximity:

I do not have a concrete physical model for users, so users may find my models somewhat hard to interpret. I should consider to involve: game sticks, touchscreen, etc.

Time:

(1) If the user is unacquainted with automobile terms and how to drive a car, then he will spend more time; (2) There are technical jargons that may cost long time. I should also consider to make a model that uses: sound, films, animations, etc.

Behaviour:

There are human behaviours in car design. However, I didn’t consider user bahaviours – I cannot collect user feedbacks on how they feel and think. E.g. I should consider involving vibration in notifications.

iii. Goal: The driver should intervene whenever he wants to prevent from dangerous accidents.

Scenario: At sunset, there is a very short child playing in front of the self-driving car, and he is in the blind zone of all the cameras. The driver sees the child and wants to control the car to brake and to turn the steering wheel by just turning the steering wheel.

Story: As a user, based on the above scenario, the driver wants to control the car and to brake it by just turning the steering wheel so that the car can prevent from hitting the child.

Solution: (1) Set different levels for self-driving cars. For level 0 cars, they shoud allow human's operations. (2) There should be a very big button near the turning wheel so that when the driver presses it, the car suddenly brakes.

iv.

When a driver wants to brake, he/she mistakenly presses the accelerator pedal (since both the brake and accelerator are controlled by the right foot), so the person in front of the car is hurt.

(710 words)

References:

- IxDF Course Instructor. "The Five Languages or Dimensions of Interaction Design." *interaction-design.org*. https://www.interaction-design.org/literature/article/the-five-languages-or-dimensions-of-interaction-design