POLIS
CITIES AND REGIONS FOR TRANSPORT INNOVATION

ANNUAL CONFERENCE 2022

30 November
1 December, 2022
Brussels, Belgium

#POLIS2022

Empathic vehicles: Detection of occupant emotion in autonomous vehicles to adapt the response

Session 2.D – Squeezing insight from safety data

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The Future Is Not What It Used To Be

Lawrence Peter "Yogi" Berra

Picture by Riccardo

Picture by Riccardo

Acceptabiliy

4,7

in a scale from 1 to 7

7.600 responses in EU countries
Source: www.suaave.eu

www.polisnetwork.eu

Picture by Tima Miroshnichenko

Picture by Klaus Nielsen

Do you trust me?

Perceived control	3,7
Perceived pleasure	3,9
Perceived safety	4,1
Perceived covenience	4,2

Trust in CAV technology

4,3

in a scale from 1 to 7

Source: www.suaave.eu

Picture by Karolina Grabowska

Anthropomorphism

Picture by Alex Knight

Alfred

Anthropomorphism advantages

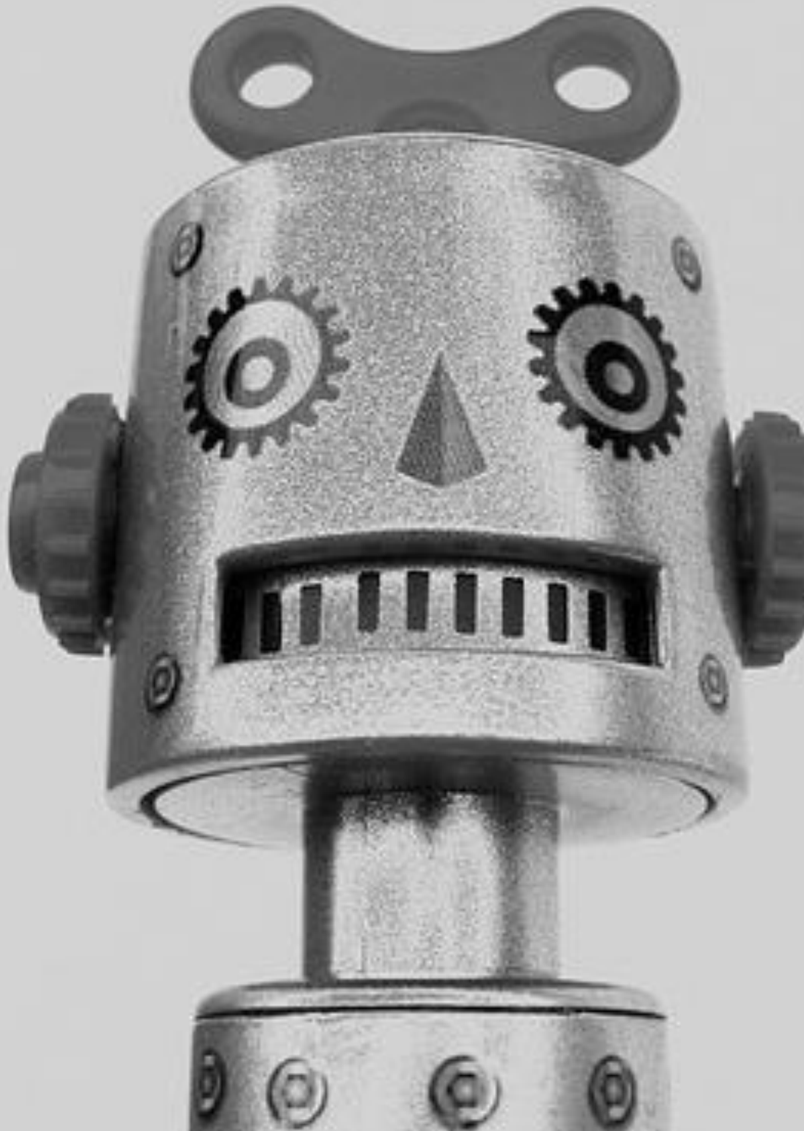
CAV

4,79

ALFRED

5,38*

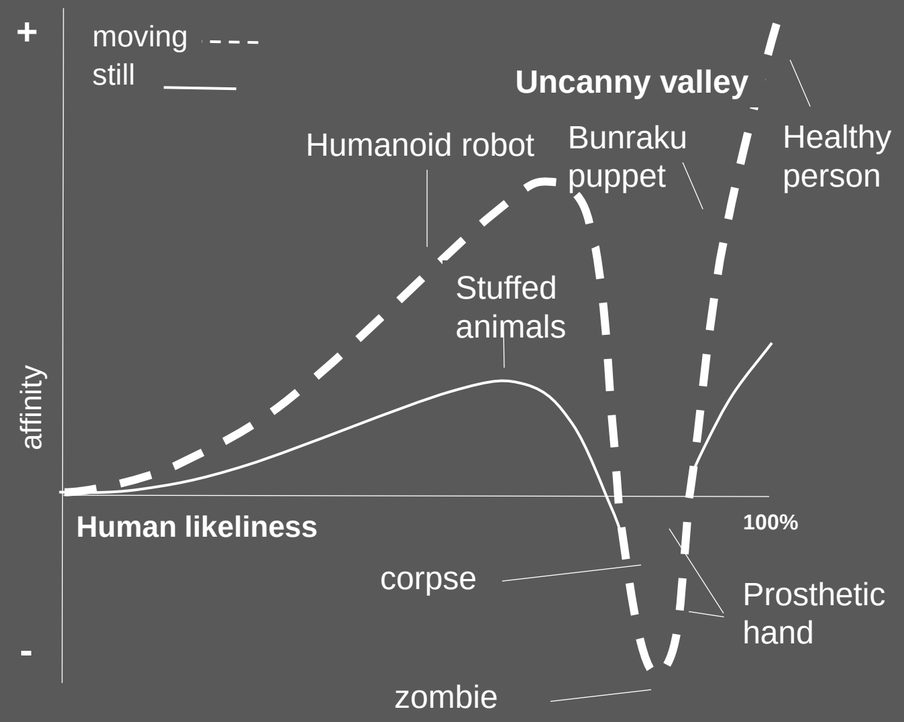
Acceptability	5,36	5,79
Perceived safety	4,95	5,14
Perceived control	4,95	5,14
Perceived pleasure	3,03	2,91
Perceived convenience	5,57	5,74

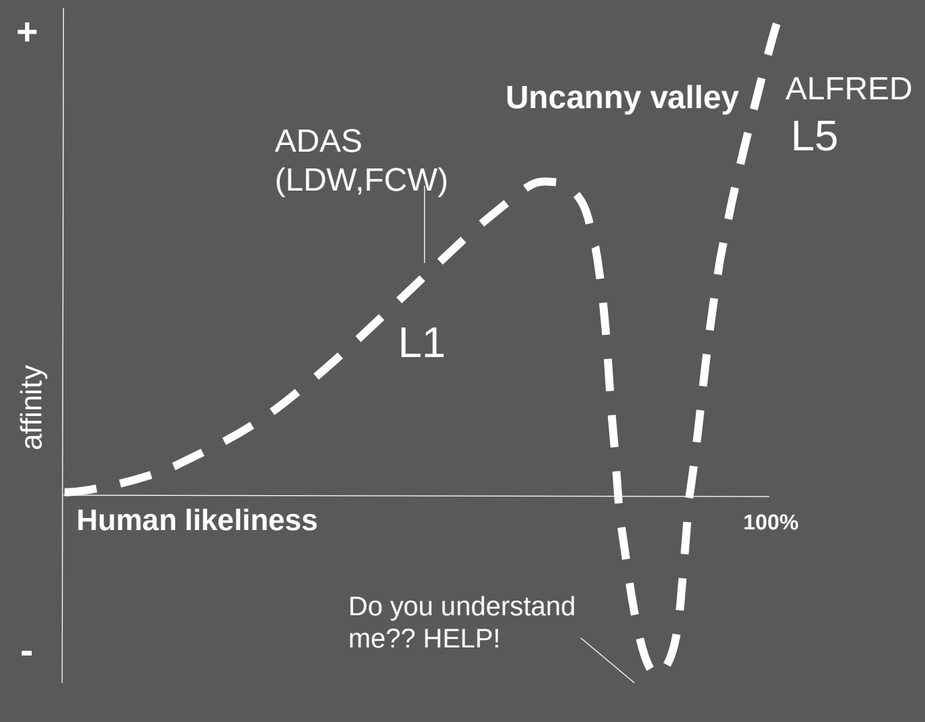


Trust in CAV technology

Ergoneon in Pixabay

Uncanny Valley





Bukimi no Tani Genshō (不気味の谷現象)

Empathy

Pixabay License

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Picture by Edu Carvalho

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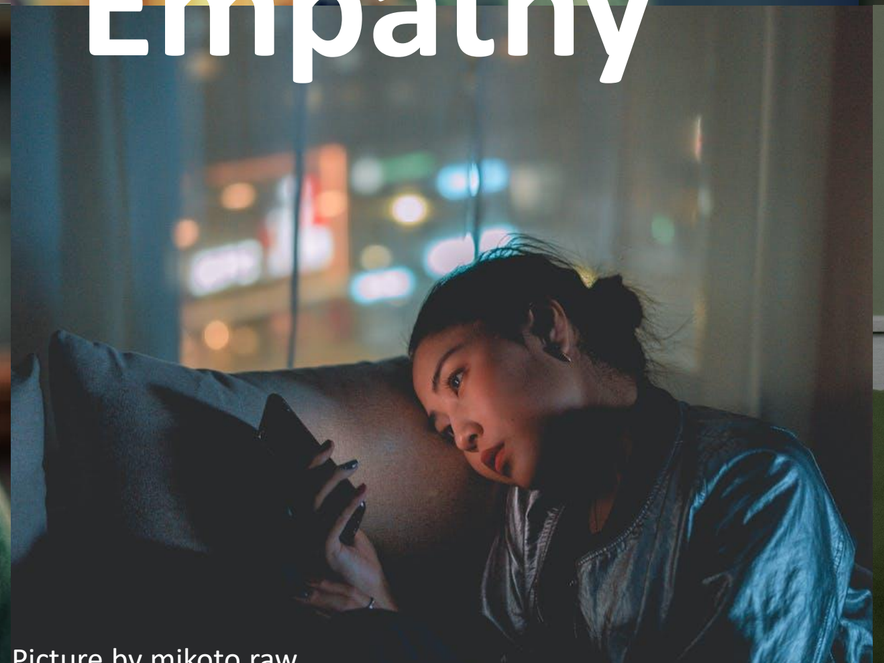

Picture by mikoto raw

Picture by Ron Lach

The empathic vehicle

EXTERNAL FACTORS (TRAFFIC, CRASHES, LIGHTS, PEDESTRIANS)

EMPATHIC MODULE

CATEGORICAL MODEL

DIMENSIONAL MODEL

EMOTIONAL STATE

COGNTIVE MODEL

OBSERVER ALGORITHM

PASSENGER STATE

DRIVER

DYNAMICS AND COMFORT

ACE (HUMAN MACHINE INTERFACE)

SIGNALS

Emotion: Anger

80
0

Emotion: Contempt

0,8
0

Emotion: Disgust

16
0

Emotion: Fear

40
0

Emotion: Joy

80
0

Emotion: Sadness

20
0

Emotion: Surprise

80
0

Emotion: Engagement

80
0

Emotion: Valence

0
-80

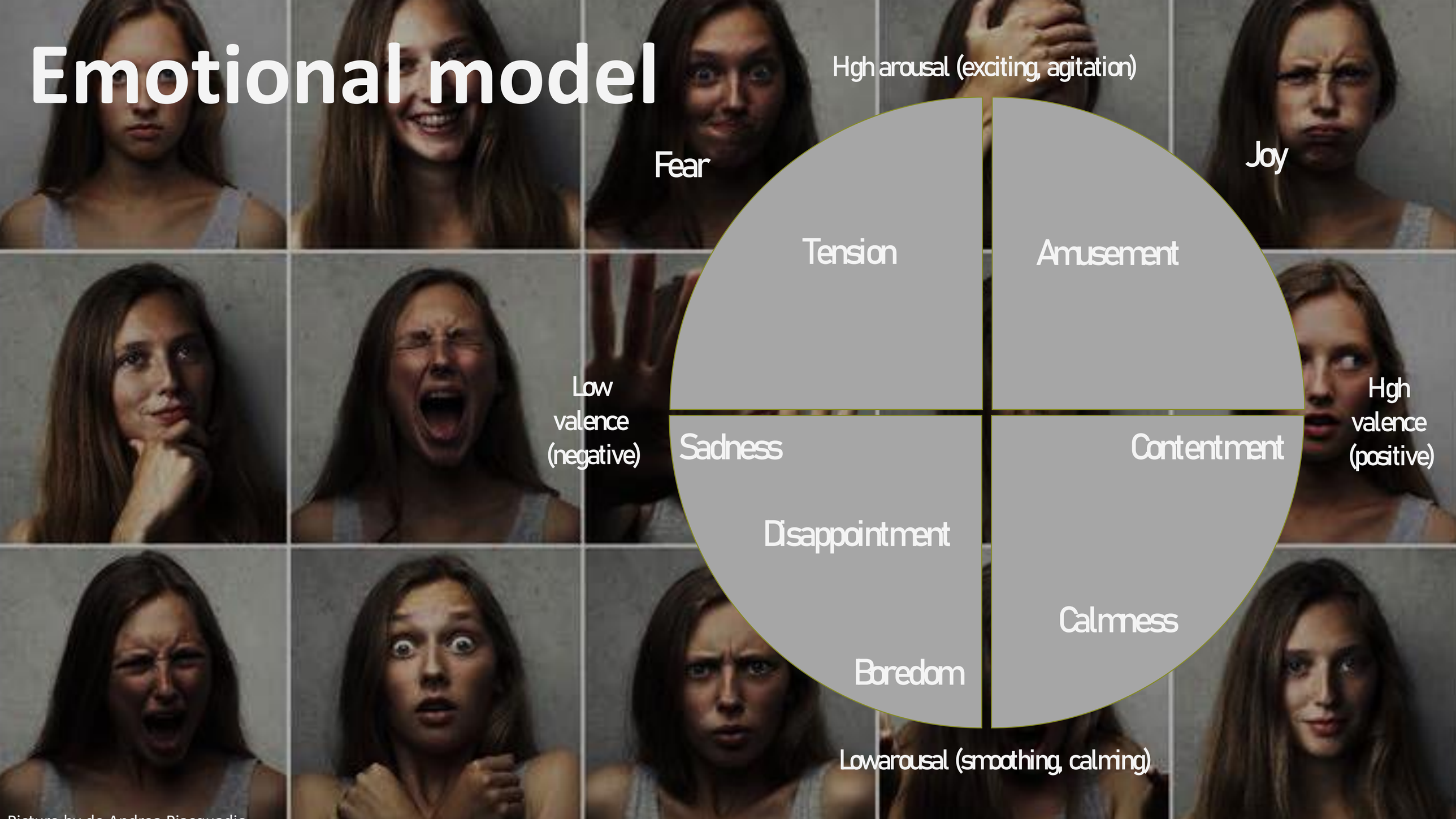
Facial Expression: Attention

80
0

RESPONDENT ANNOTATIONS

00:10 00:20 00:30 00:40 00:50 01:00 01:10 01:20 01:30

Emotional model



Picture by de Andrea Piacquadio

Pixabay license

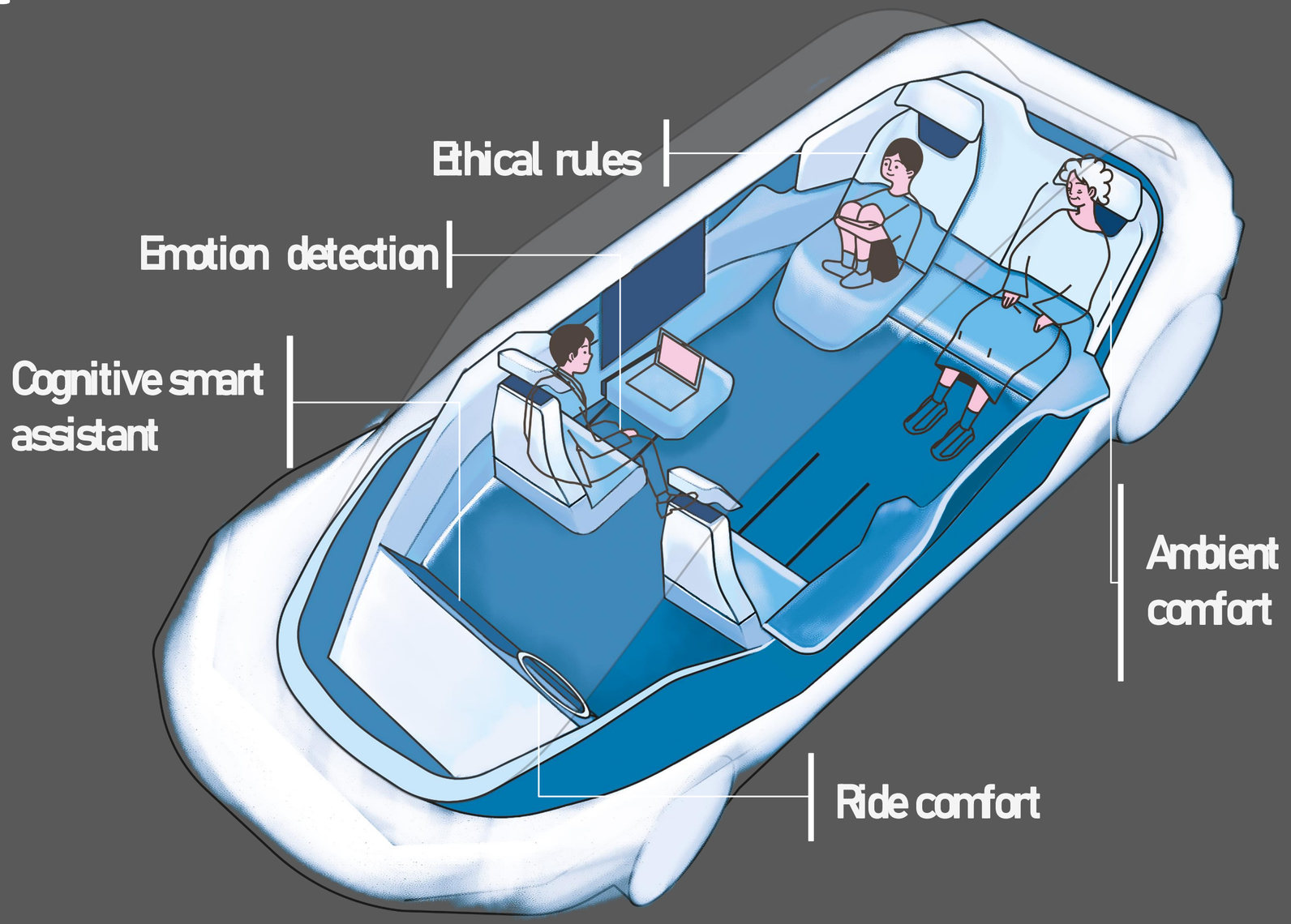
Picture by Andrea Piacquadio

Picture by Vitaly Kushnir

Pixabay license

Picture by Andrea Piacquadio

The empathic vehicle



Thank you for your attention!

For questions:

Jose.solaz@ibv.org

Want to know more? www.suave.eu