

Emotion AI: In-Vehicle Experience

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User Story



This is Charlie.



User Story



Charlie loves backyard.

User Story

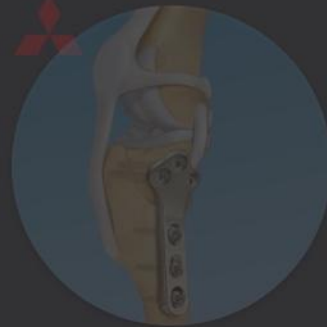


Charlie loves me.

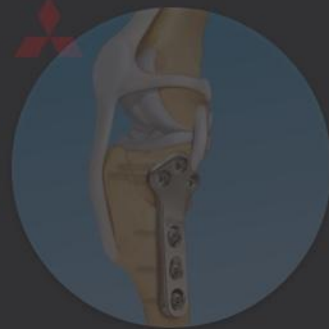
User Story



This is Luce.



User Story



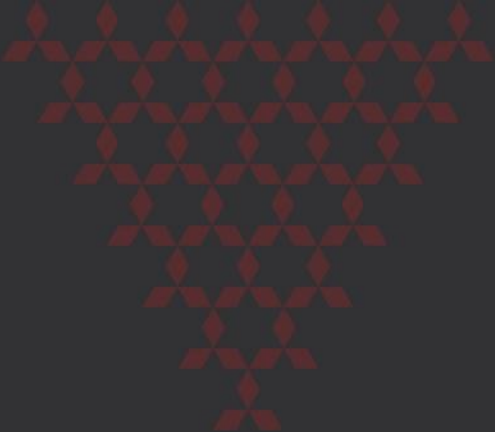
Luce loves squirrels.

User Story



Luce hurts herself.

User Story



My emotional state

User Story



My emotional state

User Story



My emotional state

User Story

105.1

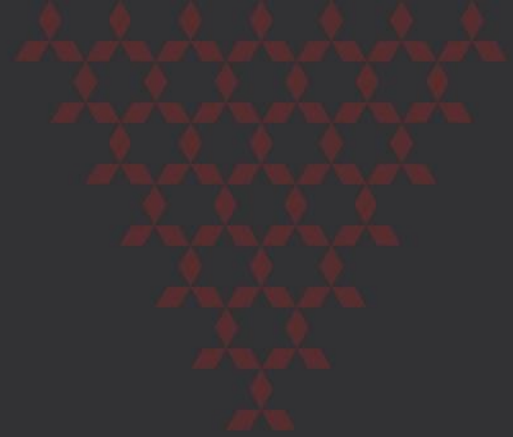
98.7



Distraction



Ideal World

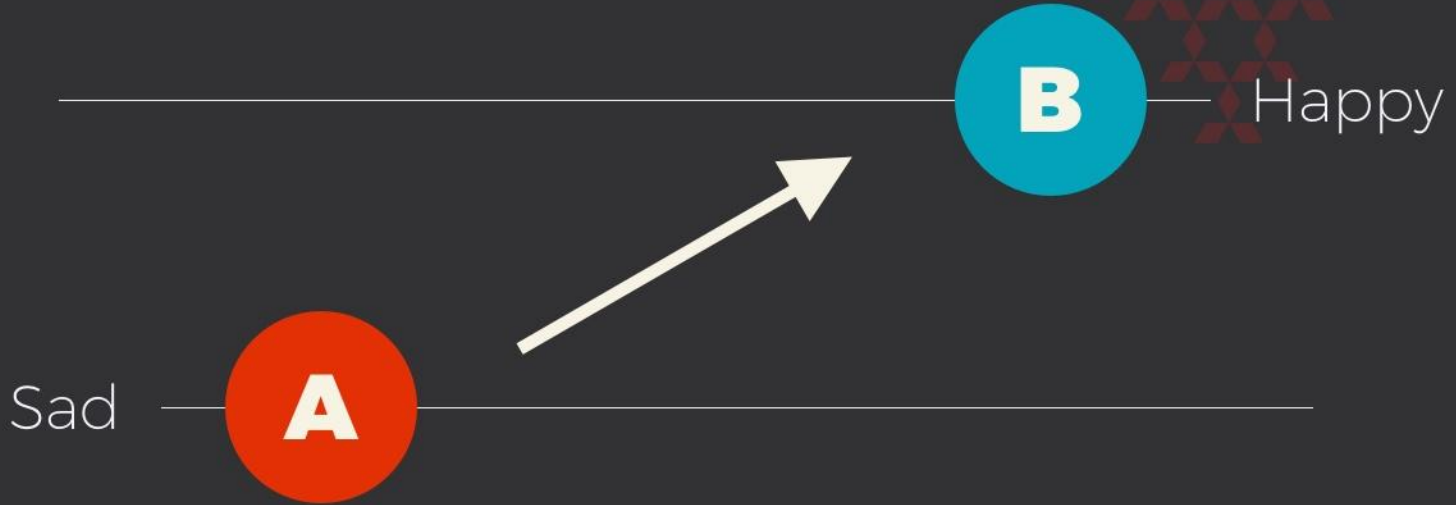


- Autonomous vehicle
- Emotion notification
- Vehicle takes over

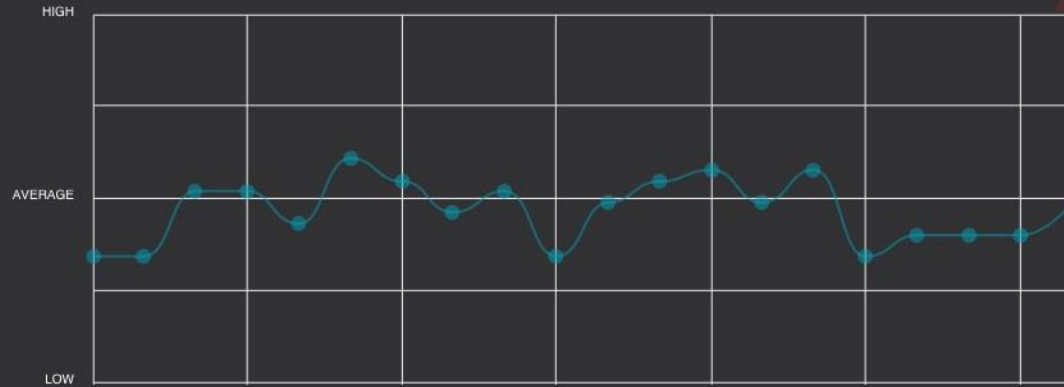
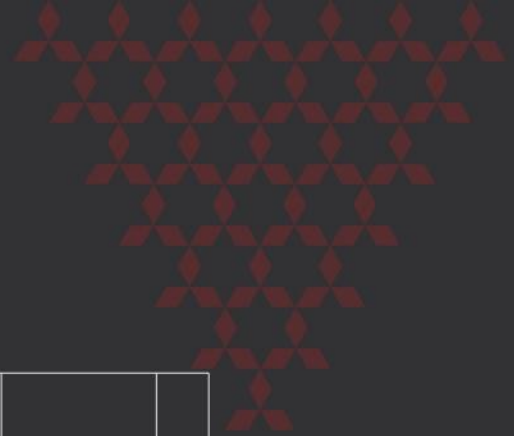
Common Assumption



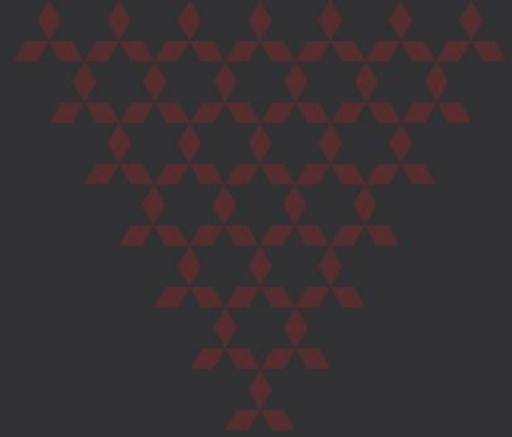
Common Assumption



Common Assumption vs. Reality

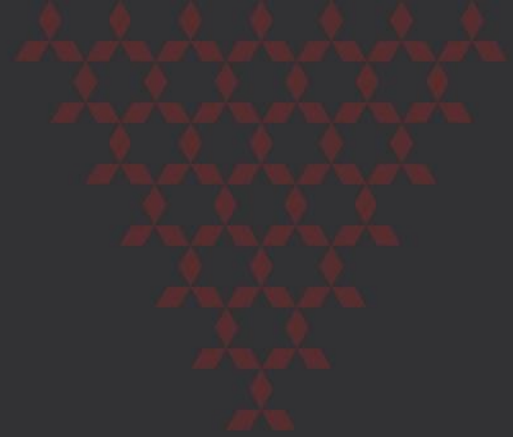


Emotion



- Pain is a part of living.
- Suffering comes when people are unable or refuse to accept pain.
- Radical Acceptance

Coping Styles



- Problem-focused
- Emotion-focused

Coping Styles

- Problem-focused
- Emotion-focused

Coping Mechanisms

- Active
- Avoidance

Coping Styles

- Problem-focused
- Emotion-focused

Coping Mechanisms

- Active
- Avoidance

Coping Methods

- Adaptive
- Maladaptive

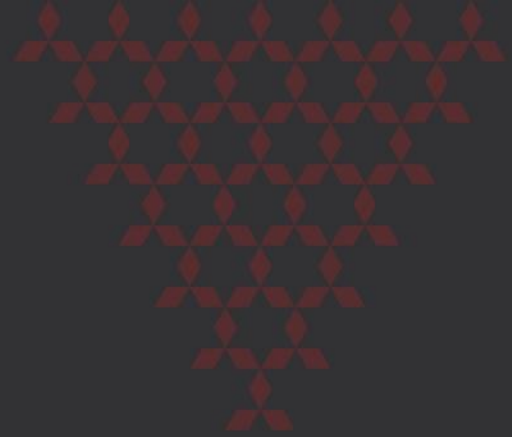
Adaptive

- Support (talking about a stressful event with a supportive person)
- Relaxation (mediation, sitting in nature, listening to soft music)
- Problem-solving
- Humor
- Physical activity

Maladaptive

- Escape (Isolation)
- Unhealthy self-soothing (overeating, drinking, excessive use of internet or video games)
- Numbing (eating junk food, excessive alcohol or drug use)
- Compulsions and risk-taking (gambling, reckless driving)
- Self-harm

In-Vehicle / Support



- Call someone
- Be that someone

In-Vehicle / Support

- Call someone
- Be that someone



In-Vehicle / Support

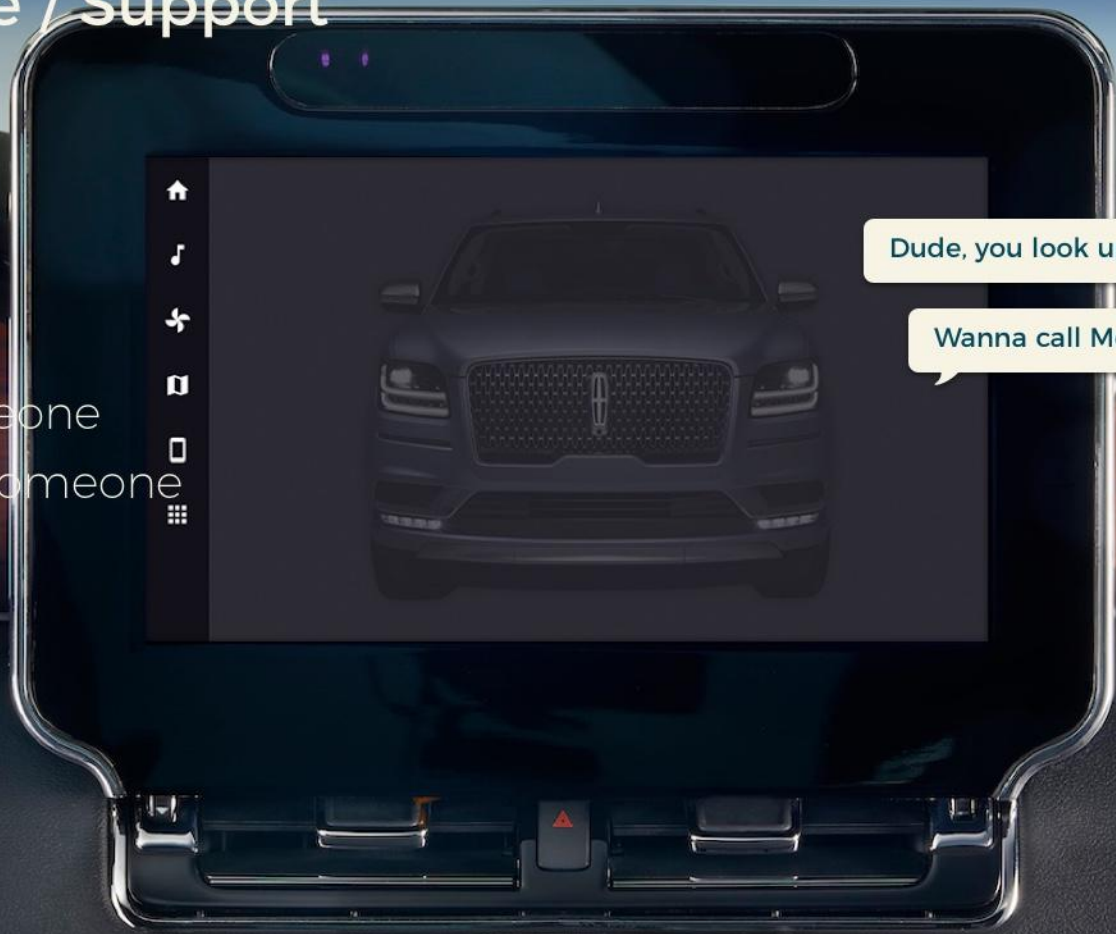
- Call someone
- Be that someone



Dude, you look upset.

In-Vehicle / Support

- Call someone
- Be that someone

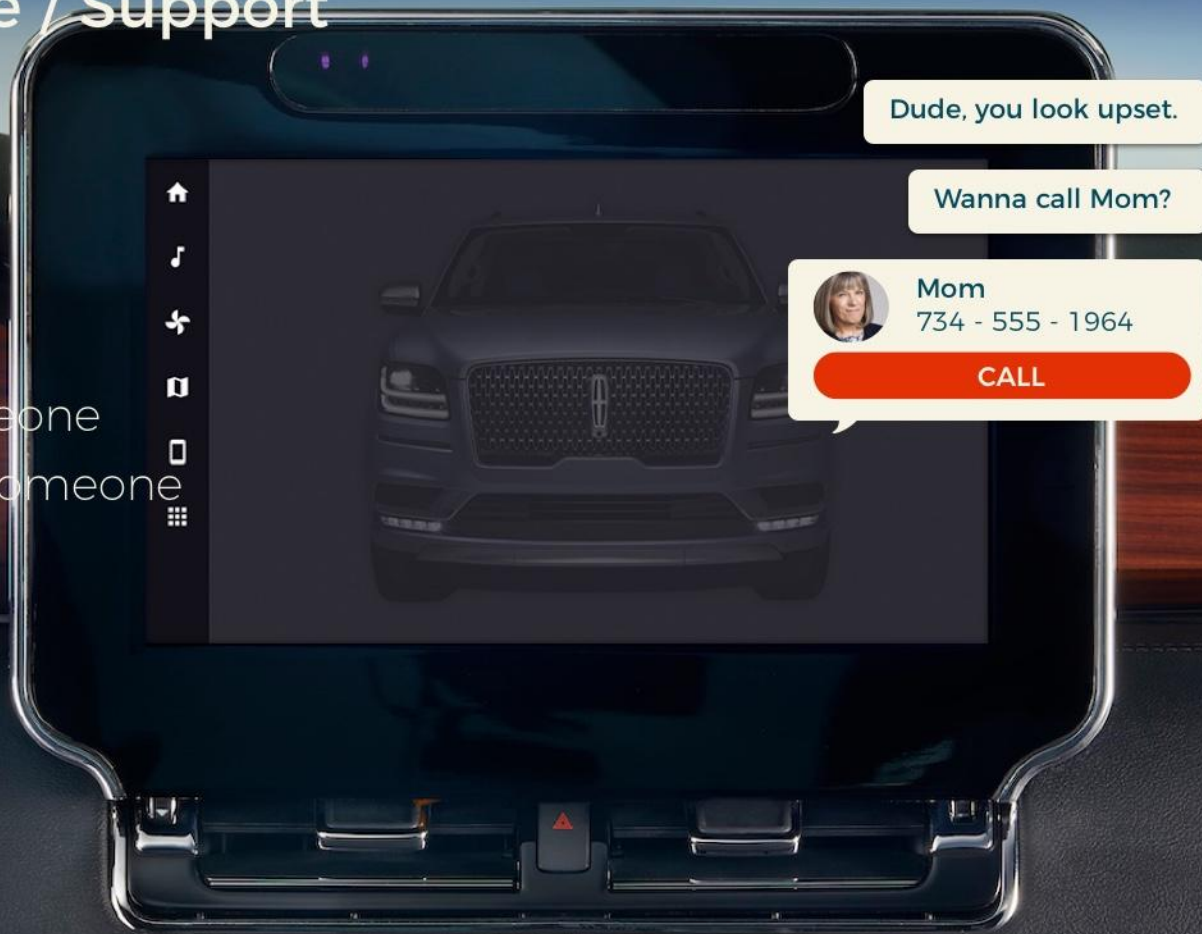


Dude, you look upset.

Wanna call Mom?

In-Vehicle / Support

- Call someone
- Be that someone



Dude, you look upset.

Wanna call Mom?



Mom

734 - 555 - 1964

CALL

In-Vehicle / Support

- Call someone
- Be that someone



Creepy?

In-Vehicle / Support

- Call someone
- Be that someone



Auto-suggest destinations

In-Vehicle / Support

- Call someone
- Be that someone



Ellie uses machine vision to interpret test subjects' verbal and facial cues

In-Vehicle / Support

- USC Institute for Creative Technologies
- Post-Deployment Health Assessment (DHA)
- Test subjects reported more PTSD symptoms to Ellie than PDHA surveys



Ellie uses machine vision to interpret test subjects' verbal and facial cues

In-Vehicle / Support

- "...don't have to ruin your career to begin seeking help."
- "Now that we've identified their symptoms, how do we ensure they get the treatment they need?"

--Gale Lucas, psychologist, USC




Ellie uses machine vision to interpret test subjects' verbal and facial cues

In-Vehicle / Relaxation

5 senses

- Seeing
- Hearing
- Smelling
- Tasting
- Touching

- 
- Practicing mindfulness
 - Listening to music

In-Vehicle / Relaxation

5 Senses

- Being mindful of your environment and the tendency to resist it
- Being mindful of the emotions as they rise and fall, come and go



Headspace

In-Vehicle / Relaxation

5 Senses

- Being mindful of all the different senses, but rather than thinking about them, judging them, or analyzing them, simply acknowledging them
- Being mindful of wanting to be somewhere else, of wishing time away



Headspace

In-Vehicle / Relaxation

5 Senses

- Being mindful of wanting to scream out loud or put your foot down in the car



Headspace

In-Vehicle / Relaxation

Seeing/Hearing



Headspace
Headspace, Inc.
★★★★★



In-Vehicle / Relaxation

Hearing

ROCK



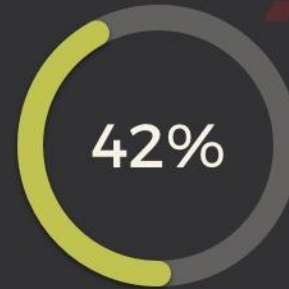
Gesture & Swear



Minor Accidents

More likely to experience road rage

CLASSICAL



Relaxing

Least likely to tailgate, speed, and to loose their cool

In-Vehicle / Relaxation

Hearing

POP



Young Pop Fan in
Accidents

Simple and repetative. Less concentration

JAZZ



Most likely to get speeding fine

In-Vehicle / Relaxation Smelling

- 2017 CLS Mercedes-Benz
- Ionization system
- Purify the cabin air
- Infuse it with subtle aromatherapy



Mercedes-Benz Climate Control
with Air Balance

Mitsubishi Electric

CES 2019



Mitsubishi Electric

CES 2019



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CES 2019

- Body size (driver, front and rear seat passengers)
- Age
- Gender
- Gaze detection
- Drowsiness detection
- Head position/Angle detection
- Looking aside and region of interest detection
- Facial parts detection
- User identification (tested on siblings, twins, and other family relations)
- Deadman/Unnatural pose detection
- Operator detection



Mitsubishi Electric CES 2019





Design Considerations

- What's going on in side the cockpit is largely unknown



40 Of The Best Parenting Hacks Ever



Design Considerations

- Understanding the source of frustration



Roadrage, Rocking out, and User Interface

Design Considerations

- Passengers monitoring systems can provide insight into area of concentration



Heatmap



Design Considerations

- Driving is not always an individual experience



Driving with passengers

Design Considerations

- Emotion alone is not enough
- Understanding user's life i.e. calendar, destination, intention, etc.



Newark Liberty Airport
@EWRairport



Design Considerations

- Could Emotion AI give insight into what users are thinking?
- Limitations:
Self conscious, moderator,
Unfamiliar environment, etc.
- Satisfaction rating



Usability Study

Design Consideration

- Provide the solution instead of blocking the experience



Waze - In motion

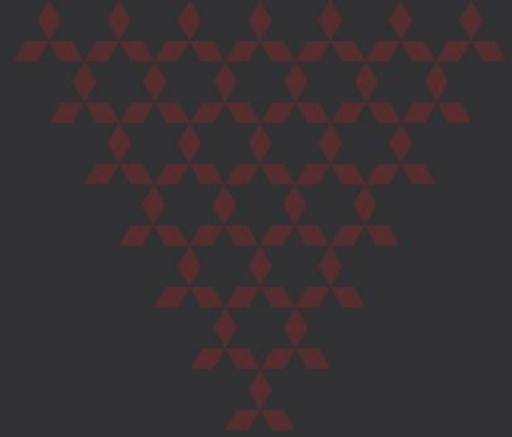
Design Considerations

- What ever you do, don't tell your user to "Calm Down"



Giphy
@diectig

Thank you



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