



Conversational Agent

Human-AI Interaction

TEAM 4

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What is the problem to be solved?

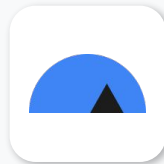


Context / Problem

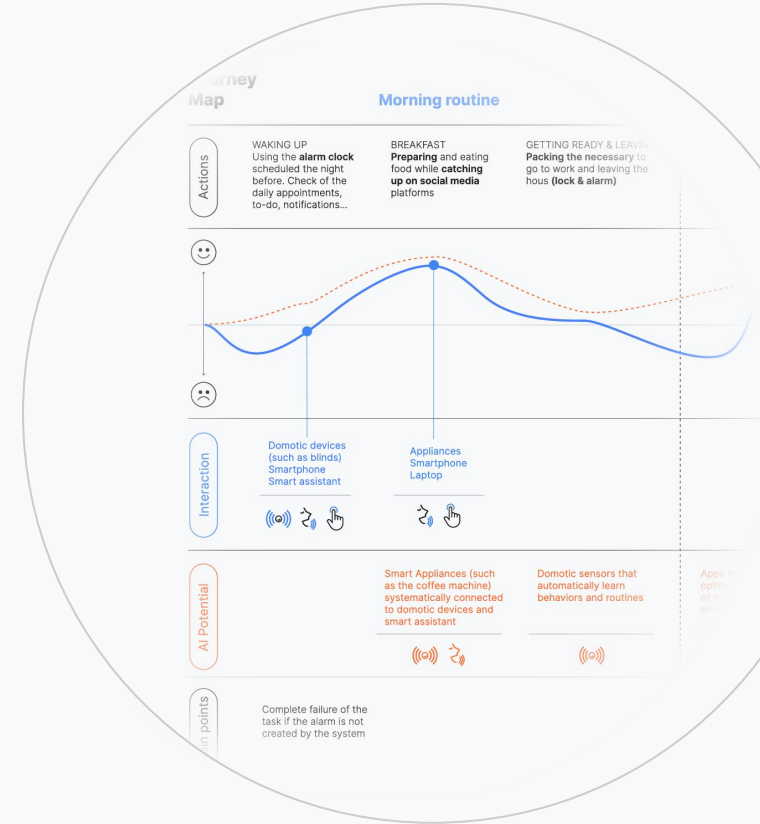
In the last few years smart appliances have become part of our life, our house has become smarter and always connected. However, the interaction with those device is still difficult because of the different kind of interfaces and not always interoperable.

Main goal

Help users to interact with all smart-home appliances



Homie



Design of the conversational UI



Type

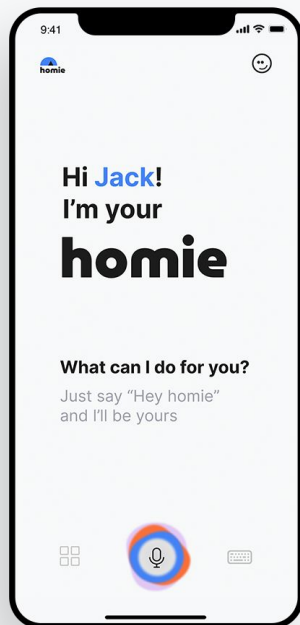
Mobile App

Interaction

Mixed
textual and
vocal input

Tone

Colloquial



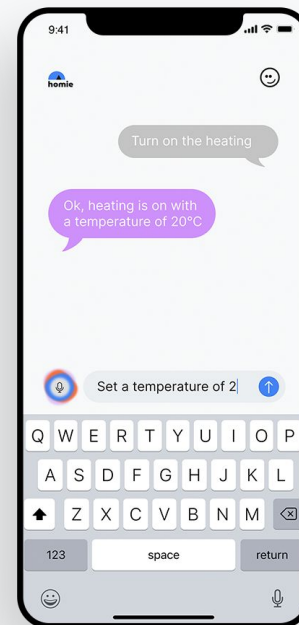
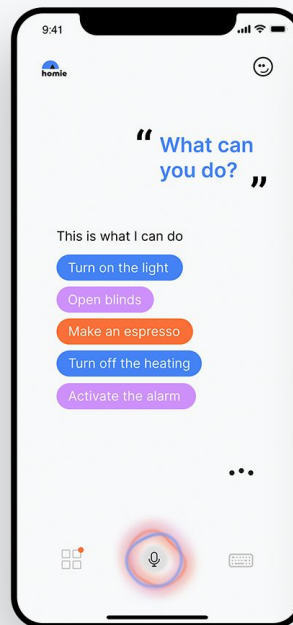
Features

It interacts with smart appliances like:

- lights
- blinds
- alarm
- thermostat
- coffee machine


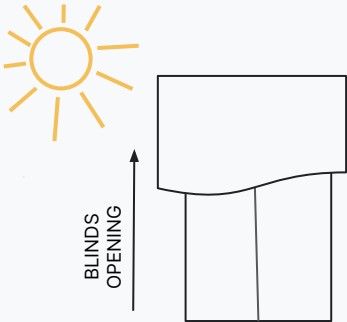
Actions

Turn on/off light,
make coffee, set
the alarm, regulate
heating...



Homie features & guidelines*



<p>G7 - SUPPORT EFFICIENT INVOCATION</p> <p><i>“Hey Homie”</i> invocation</p>	<p>G15 - ENCOURAGE GRANULAR FEEDBACKS</p> <p>Switch on the light</p> <p>What is the room?</p> <p>Bedroom</p> <p>Ok, bedroom lights are now on</p>	<p>G8 / G9 - SUPPORT EFFICIENT CORRECTION</p> <p><i>“Undo last action”</i> dismissal</p>
<p>G18 - NOTIFY USERS ABOUT CHANGES</p> <div><p>Notification for new features and capabilities</p><p>today, 11:31</p></div>		<p>G4 - AUTOMATION BASED ON CONTEXTUAL INFO</p> 
<p>G2 - MAKE CLEAR AI CAPABILITIES AND LIMITS</p> <p><i>“Could you repeat?”</i> disambiguation</p>		

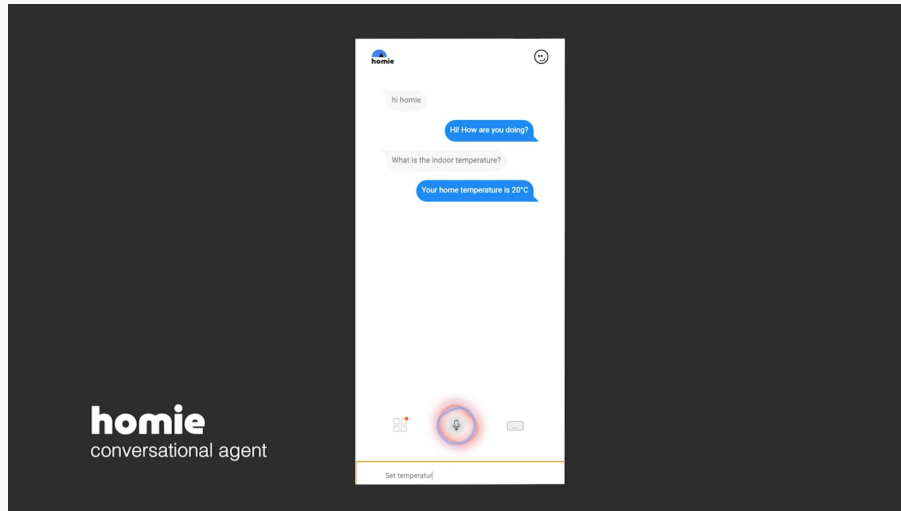
*In attendance with the “Guidelines for Human-AI Interaction” <https://www.microsoft.com/en-us/hxtoolkit/library/> (see Appendix for the complete lists)



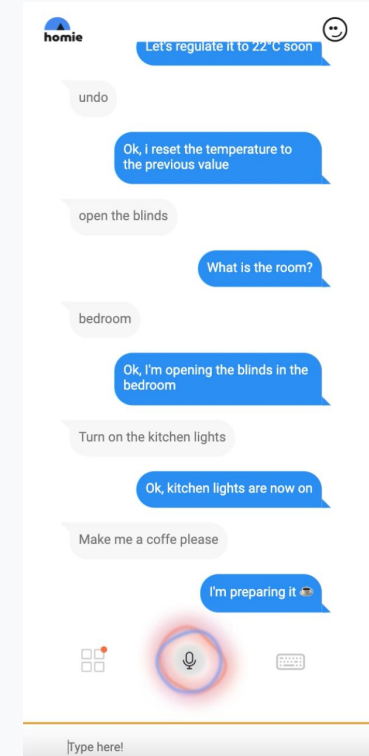
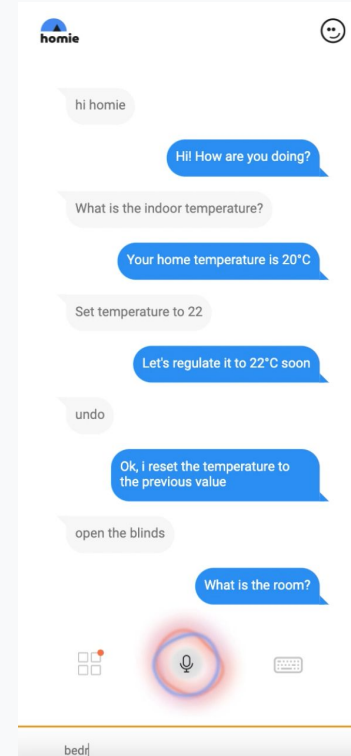
Prototype of the conversational agent



VIDEO DEMONSTRATION



<https://youtu.be/WSeISS1ADW0>





Appendix

Conversational Agent

Human-AI Interaction guidelines



G1 - Make clear what the system can do / G18 - Notify users about changes

There is a command that lists the possible functionalities. Moreover, when the system updates it notify the user about new features and capabilities

G2 - Make clear how well the system can do what it can do

In order to avoid overestimation of AI capabilities, in case of failure in recognizing the voice input a feedback is given ('could you repeat?')

G3 - Time services based on context

The agent wakes up with the wake word 'Hey homie' and stops after an action is performed correctly

G4 - Show contextually relevant information

It is one of the functionalities and the user can access the appliances status with voice commands. Depending on the hour of the day and the user habits it can provide additional contextual information without explicit request 'the blinds are open, it is sunny'

G5 - Match relevant social norms / G6 - Mitigate social biases

By design our agent does not present any social/cultural biased behaviours. The agent training is based on non-stereotyped data



Human-AI Interaction guidelines



G7 - Support efficient invocation

The wake word “hey homie”

G8 - Support efficient dismissal / G9 - Support efficient correction

The ‘undo’ word permits to dismiss the action performed and corrects the action by revert to the previous situation

G10 - Scope services when in doubt

In case of disambiguation/multiple interpretation (e.g., “turn on the light”), the agent is designed to interpret the user goal, select the most probable solution and ask confirmation before performing it

G11 - Make clear why the system did what it did

Not applicable

G12 - Remember recent interactions / G13 - Learn from user behavior

Yes, the agent has a short time memory to remember previous actions (and in case undo the action) as well as learn from user habits. For instance, the user always turn on the light at 8:00 then the agent at 7:59 asks if the user wants to turn on the light.



Human-AI Interaction guidelines



G14 - Update and adapt cautiously

The AI upgrade is performed manually, since possible security and privacy issues are concerned

G15 - Encourage granular feedback

Implemented in use case described in G10

G16 - Convey the consequences of user actions

When the agent discovers a typical pattern in the user actions, it asks the user whether perform that specific pattern automatically or not.

G17 - Provide global controls

Global controls are set in the initial configuration of the agent (e.g., appliances connections, wifi settings etc.)

NG - Other





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