How to build a Social Computer Seminar

- Presentation 2 -

Social Anxiety Trainer

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Progress - Overview

1. Initial questionnaire
2. Created and evaluated tasks
3. Included heart rate from Microsoft Band
4. Classification of current anxiety level based on voice
Initial Questionnaire

- Appears when using the app the first time
- Terms and conditions before start
- Why? Understand…
  - that honesty is key
  - how to answer the questionnaire
  - how the app works
  - what is monitored
- Important for the user to feel comfortable
- Necessary for the app to work correctly
- Avoid overstraining
  - well-being of user is priority
Initial Questionnaire

- **SOCIAL ANXIETY QUESTIONNAIRE FOR ADULTS (SAQ)** (Caballo, Salazar, Arias, Irurtia, Calderero, & CISO-A Research Team, 2010)
- Answer before and after using the app → show progress
- Scores in five categories
  - Talking with Strangers
  - Speaking in public/Talking with people in authority
  - Interactions with the opposite sex
  - Criticism and embarrassment
  - Expression of annoyance, disgust or displeasure
Initial Questionnaire

1. Greeting someone and being ignored
   - Not at all or very slight
   - Slight
   - Moderate
   - High
   - Extremely High

- Questions belong to different categories
- Sum up scores
- Cut-off values to determine levels of anxiety
- Different levels in different categories
- Low, moderate and high anxiety
- High anxiety means low skill level
  - low anxiety = skill level 3, moderate = 2, high = 1
Tasks

- Divided by the same five categories as were used in the questionnaire

- Category: Talking with Strangers
  Difficulty: 3
  Description: ask a stranger what his/her favorite restaurant is and where you can find it because you are new in town

- Category: Speaking in public/Talking with people in authority
  Difficulty: 1
  Description: present a topic you’re interested to a group of friends

- Category: Interactions with the opposite sex
  Difficulty: 1
  Description: ask a person you find attractive if you can sit next to him/her in the bus/train

- Category: Criticism and embarrassment
  Difficulty: 2
  Description: say that you lost your phone and ask someone that you need to make an urgent call
Tasks

- **Difficulty levels:**
  - from 1 to 3
  - questionnaire + performance in tasks so far determine levels
  - each category level is independent from the other categories
  - successful accomplishments → level up
  - incomplete task → level down
  - give the motivation to finish tasks
## Tasks

- **Description**
  - short
  - easy to understand
  - easy to see the purpose of the concrete task

<table>
<thead>
<tr>
<th>Category</th>
<th>Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talking with Strangers</td>
<td>3</td>
</tr>
<tr>
<td>Description: ask a stranger what his/her favorite restaurant is and where you can find it because you are new in town</td>
<td></td>
</tr>
<tr>
<td>Speaking in public/Talking with people in authority</td>
<td>1</td>
</tr>
<tr>
<td>Description: present a topic you're interested to a group of friends</td>
<td></td>
</tr>
<tr>
<td>Interactions with the opposite sex</td>
<td>1</td>
</tr>
<tr>
<td>Description: ask a person you find attractive if you can sit next to him/her in the bus/train</td>
<td></td>
</tr>
<tr>
<td>Criticism and embarrassment</td>
<td>2</td>
</tr>
<tr>
<td>Description: say that you lost your phone and ask someone that you need to make an urgent call</td>
<td></td>
</tr>
</tbody>
</table>
Tasks

- **Choice of tasks:**
  - one task for each category chosen randomly
  - tasks fit user’s level of anxiety
  - user can decide the category, but not the task
  - out of comfort zone (random selection from system, what task is given)
  - if a task is not finished, it will appear again
Pilot Study - Tasks

- We created tasks and randomized them in a questionnaire
- n=21
- Participants should rate the tasks (1-3) according to difficulty level those tasks belong

→ Evaluation: we calculated the mean values for each item → depending on the results we divided the tasks into the difficulty levels
Please rate the following tasks from 1 to 3 (1 = slightly uncomfortable, 2 = moderately uncomfortable, 3 = very uncomfortable)

Mark your answer red or cross it out. The questionnaire has 2 pages.

Please rate all the items and do so honestly; do not worry about your answer because there are no right or wrong ones. Thank you very much for your participation!

<table>
<thead>
<tr>
<th>Task</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make eye contact with a person you would like to talk to</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Ask a police officer about the way/where you can park for free</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Ask a stranger what the current time is</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Dance funny at a party</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Compliment a person you find attractive</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Enforce your opinion in a project or a meeting</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Ask an employee at a store for a discount</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Visit the cinema on your own</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Make a bad joke</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Give honest feedback if someone asks you for your opinion on something</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Smile at an attractive stranger on the street</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Ask somebody to take a picture of you in front of a sight (or a building of your choice)</td>
<td>1 2 3</td>
</tr>
<tr>
<td>Make eye contact with a person you find attractive</td>
<td>1 2 3</td>
</tr>
</tbody>
</table>
Pilot Study - Results

- we looked at the mean value for each item
- almost all items were rated 1 or 2 (only 2 were rated 3)

→ but the population was not our targeted population (people with mild social anxiety)

→ adjustments

<table>
<thead>
<tr>
<th>Deskriptive Statistik</th>
<th>N</th>
<th>Mittelwert</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make eye contact with a person you would like to talk to</td>
<td>21</td>
<td>1.3333</td>
<td>1</td>
</tr>
<tr>
<td>Ask a police officer about the way/ where you can park for free</td>
<td>21</td>
<td>1.5238</td>
<td>2</td>
</tr>
<tr>
<td>Ask a stranger what the current time is</td>
<td>21</td>
<td>1.2381</td>
<td>1</td>
</tr>
<tr>
<td>Dance funny at a party</td>
<td>21</td>
<td>1.6190</td>
<td>2</td>
</tr>
<tr>
<td>Compliment a person you find attractive</td>
<td>21</td>
<td>1.8571</td>
<td>2</td>
</tr>
<tr>
<td>Enforce your opinion in a project or a meeting</td>
<td>21</td>
<td>1.7619</td>
<td>2</td>
</tr>
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<td>Ask an employee at a store for a discount</td>
<td>21</td>
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</tr>
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<td>Visit the cinema on your own</td>
<td>21</td>
<td>1.7619</td>
<td>2</td>
</tr>
<tr>
<td>Make a bad joke</td>
<td>21</td>
<td>1.6687</td>
<td>2</td>
</tr>
<tr>
<td>Give honest feedback if someone asks you for your opinion on something</td>
<td>21</td>
<td>1.5238</td>
<td>2</td>
</tr>
<tr>
<td>Smile at an attractive stranger on the street</td>
<td>21</td>
<td>1.4286</td>
<td>1</td>
</tr>
</tbody>
</table>
Include heart rate

- Hardware: Microsoft Band 2
- Tracks heart rate
- Microsoft Health App needs to be installed on the phone
- Connection via bluetooth
- Microsoft Band SDK needs to be added to the project
Connect Microsoft Band

- Item in navigation menu
Connect Microsoft Band

- Item in Navigation menu
- Simple UI
Connect Microsoft Band

- Item in Navigation menu
- Simple UI
- Feedback if setup is successful
- Transfers heart rate to phone until disconnected
- Later input for anxiety classifier
Classification of Anxiety Level

- Voice classification in real-time
- Used software:
  - Social Signal Processing for Android framework (SSJ)
  - EmoVoice plugin (Naive Bayes Classifier)
- Output:
  - valence (Float)
  - arousal (Float)
- Values are input for the anxiety classifier
- Other input values (heart rate, user feedback) will follow soon
- Anxiety levels: None, Low, Mild, High
Classification of Anxiety Level

- Task category and description always visible
- Anxiety level visible
  - general feedback
  - feedback is necessary
- What we don’t show:
  - level
  - heart rate
  - valence/arousal values
- Avoid explicit data that might increase anxiety
Problems

- No Emulator for Microsoft Band compatible with Android Studio
  - heart rate simulator for development necessary
  - needs to be deleted in the final app
- App only works when Microsoft Health App is installed
- Microsoft Band is not a very popular smart watch → limited usage
- Band SDK no longer available via microsoft
  - Internet Archive Wayback Machine
Problems

- openSMILE was not possible to include in the Android app
  - not maintained since 2016
  - requires outdated development kits
  - needed even to modify the C++ code to compile it successfully
  - ...

- EmoVoice’s classifier seems to be not accurate
  - valence and arousal values are increased when it is totally silent
Future Planning

● Feed the classifier with all component outputs:
  ○ heart rate (weighting: 40%)
  ○ voice (weighting: 30%)
  ○ User comfortableness (weighting: 30%)
● Improve the classifier
  ○ Experiment with different parameters (weighting, threshold values, …)
● Tutorial (UI needs to be final)
● Add support for other smartwatch devices
Future Planning

● Pictures for tasks
  ○ appealing UI motivates
● Reward system - how to motivate users?
  ○ coins
  ○ achievements
  ○ smiley feedback
● Reminder function
● Export function for therapist
Future Planning

● Social component
  ○ support from others
  ○ exchange
  ○ share achievements

● Community for app users is a project on its own
  ○ a lot of effort to implement/setup
  ○ but: very important aspect for motivation
Future Planning

- Show progress
  - heart rate, voice, comfortableness in one graph (+mean value)
  - mean value is expected to go down with practise
    visible decrease of anxiety level
Discussion

● How to show the progress?
  ○ during task? After? Both?
  ○ different graphs for different categories?

● How to level up and level down
  ○ how easy to gain a level?
  ○ how many incomplete tasks before losing a level?
  ○ too easy and too difficult both reduce motivation

● Should the difficulty level be visible?
  ○ how might it affect the user?
Thank you for your attention!

Questions?
References


References


References


References - Pictures

