Augmenting Social Interactions

Realtime Behavioural Feedback using Social Signal Processing Techniques

Ionut Damian, C. S. Sean Tan, Tobias Baur, Johannes Schöning, Kris Luyten and Elisabeth André
Motivation

- Nonverbal behaviour plays a more significant role during the interaction than verbal behaviour [Birdwhistell 2011, Mehrabian 1981]
  - Impacts the outcome of the interaction, e.g. getting hired [Hollandsworth 1979]
- Training is usually required to gain control and master one’s nonverbal behaviour
  - Most common: offline practise sessions with professional coaches
  - Time consuming, costly
Logue augments the user’s social interaction by providing automatic real-time feedback with the goal of empowering the user’s social skills.
Behaviour Analysis

Feedback Generation

sensors

HMD

Logue
• Realtime multimodal analysis and classification of social signals
  – Uses the SSI framework [Wagner 2013]
• Social Signals
  – Speech rate
  – Body movement energy
  – Body movement openness
• Sensors
  – Body analysis: Microsoft Kinect, Myo
  – Voice analysis: Microphone
Behaviour Analysis

Feedback Generation

sensors

HMD
• Increase self-awareness of one’s behaviour without interfering with the main activity

• Hardware
  – Optical see-through HMD (Google Glass, Vuzix STAR 1200)

• 3 Feedback classes:
  – speech rate, energy, openness
  – 2 icons / class to communicate behaviour intensity and appropriateness
  – Icons and appropriateness thresholds have been empirically determined in pre-studies
15 speakers, 2 observers

Task: Hold 5 min presentation

2 Conditions: system on, system off
- within subjects
- randomized order, 2 weeks apart

Data acquisition: social signal recordings, questionnaires (speaker/observers)
Objective analysis of recordings:
Amount of inappropriate behaviour decreased when system was on
Example user reaction:
Every time the user received negative feedback, he quickly adjusted his openness.
Study 2: Qualitative study in a real presentation setting

3 speakers, 13 observers

**Task**: Present PhD progress

**Data acquisition**: semi-structured interview
“...once I saw the feedback that I was talking too fast, I tried to adapt.”
“[...] once I saw the feedback that I was talking too fast, I tried to adapt.”

“[...] most of the time I did not perceive the system, only when I consciously looked at the feedback.”
“ [...] once I saw the feedback that I was talking too fast, I tried to adapt

“ [...] most of the time I did not perceive the system, only when I consciously looked at the feedback

“ It was a good feeling seeing everything [the icons] green ... it’s like applause, or as if someone looks at you and nods. However, the green lasts longer than a nod [laughs]
Augmenting social interactions
  – Realtime feedback to empower user’s social skills

Logue uses social signal processing and an HMD to augment the user while speaking in public
  – Open source and free for download

2 user studies showed that Logue
  – Has a positive impact on the user’s behaviour during a public speech
  – Does not distract the user from the main task
Future Work

• Explore other scenarios
  – Cultural training
  – Job interviews

• Optimize feedback delivery
  – Multiple modalities
  – Evaluation of how user perceives feedback

• User customization
  – Allow user to customize feedback classes, thresholds, etc.
Thank you

damian@hcm-lab.de