“Hello HARLIE”: Enabling Speech Monitoring Through Chatbot Conversations

Dr. David Ireland
Remote Monitoring Research

- Movement & mobility
- Well-being
- **Voice & Language**
- Medication
- Legal & ethics
Some People Have Trouble Communicating

- Conversation initiation
- Turn-taking
- Topic management
- Word-retrieval & memory
What about using a chatbot?

A computer program designed to simulate conversation with a human
Research Questions

1. Can chatbots help the health clinicians and researchers?

2. Can chatbots provide people with a way to privately practise their communication?
H.A.R.L.I.E.
Human and Robot Language Interaction Experiment

• Full voice operation
• Small-talk topics
• Ask for speech tasks
• Remote monitoring
Conversing with HARLIE

Hello there! How are you?

Press and Hold To Speak

14:07:43 16/11/2015

Exit

Conversing with HARLIE
Goodbye HARLIE

Can this audio and dialogue be used for research purposes?

Hello there! How are you?

Yes  No
Conversation Features

1. Drive the dialog toward a goal
2. Recall previous conversations
3. Change the subject
4. Keep context
5. Interface with other computers
Demo Chat With HARLIE
Focus Group Studies
Focus Group Studies
Visualising Interaction

Greeting

Time

HARLIE  SILENCE  HUMAN
Visualising Interaction

Wood Work

Time

HARLIE  SILENCE  HUMAN
Visualising Interaction

Time

- Harlie
- Silence
- Human

Good-byes
Large Volume of Useable Data Collected

- 156 Users (51 from focus groups)
- 390 conversations (30,000+ words)
- 13 hours of collected human audio
- 20 minutes of collected speech tasks
What can we measure?

• Speech / syllable rate
• Vocabulary range
• Mid-sentence pauses
• Fundamental frequency variations
• Vowel articulation
Developments to Date

• i-HARLIE (iOS version)
• Human-computer interaction studies
• Clinical workshop
Thank you to all contributors

- Dr. Jacki Liddle (Occupational Therapist)
- Ms Alana Campbell (Speech Pathologist)
- Dr Dana Bradford (Neuroscientist)
- Ms. Olivia Rushin (Psychologist)
- Dr. Christina Atay (Psychologist)
- Pr. Janet Wiles (Complex Systems / Engineering)
- Pr. David Copland (Speech Pathologist)
- Dr. Adam Vogel (Speech Pathologist)

- Centre of Excellence in the Dynamics of Language for funding.
- Community groups
Thank you

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