Swiss Cottage

A Game to Train Speech Recognition for Affective Computing Treatments of ADHD

Porcheron, Martin　　　Arch, Kyle　　　Luland, Steven D.
Blanchfield, Peter　　　Valstar, Michel F.　　　Chowanda, Andry

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A Quick Definition

"Affective Computing is trying to assign computers the human-like capabilities of observation, interpretation and generation of affect features" [2]

SEMAINE

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Automatic Expressive Behaviour Understanding

- Looking for visual and vocal cues for mental disorders
  - Decision Support for diagnosis
  - Monitoring of diagnosed patients
  - Delivery of treatment or therapy

Training Data

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- Target users include those with ADD and ADHD
- Conventional methods don't work
- We must deliver the training in an *engaging* and *unobtrusive* manner

Overview of the Game

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- Two player (vs. AI)

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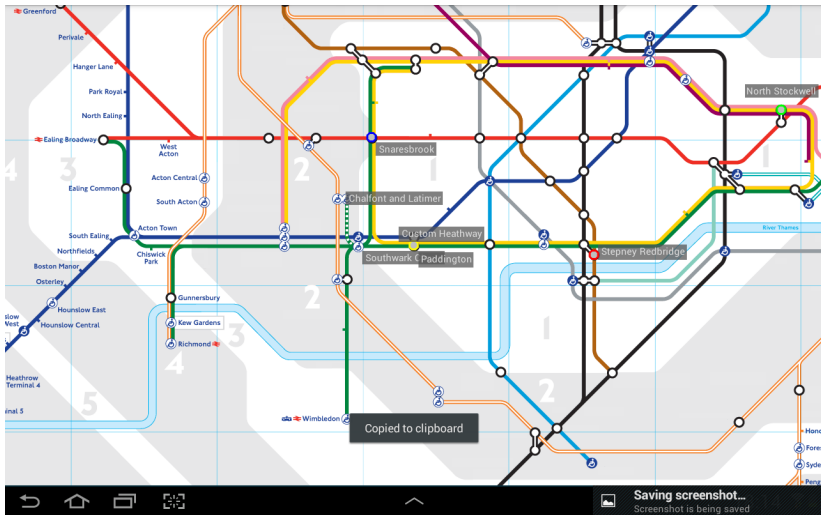- Presented as an underground rail network

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- Adversarial
- Played on a two-dimensional graph
- Presented as an underground rail network
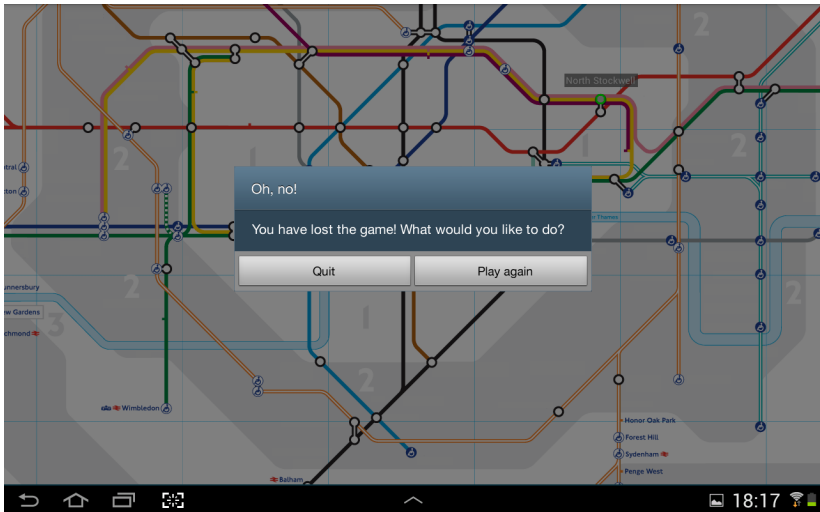- First to their unique destination wins

Screenshots (1)

Screenshots (2)

Screenshots (3)

Screenshots (4)

Training Speech Recognition

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- Players move by orally declaring their next move

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Training Speech Recognition

- Players move by orally declaring their next move
    - "Move to Swiss Cottage!"
- Infer possible destinations by examining list of current neighbours
- Station names are randomly generated from actual underground stations

AI Player

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- Utilises Dijkstra's algorithm

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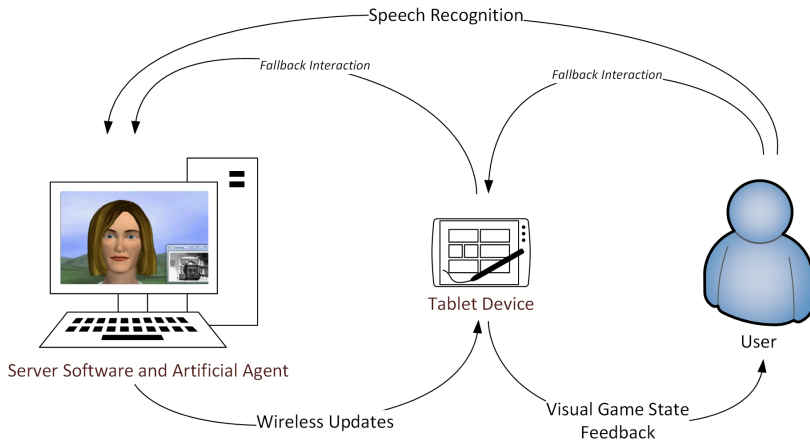- Aware of phonemes in station names for current session

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AI Player

- Utilises Dijkstra's algorithm
- Aware of phonemes in station names for current session
- Aware of what phonemes have been heard
- Balances a challenging game vs. a winnable experience vs. desire to hear new phonemes

Physical Architecture 1

Speech Recognition

Fallback Interaction

Fallback Interaction

Tablet Device

User

Server Software and Artificial Agent

Wireless Updates

Visual Game State
Feedback

Physical Architecture 2

Importance of the Tablet

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- Situated on table between player and AI avatar

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- Situated on table between player and AI avatar
- Recreates traditional board game feel
- Can also act as a fallback should speech recognition fails

Trials

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- Piloted at University of Nottingham MayFest 2013

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Looking to the Future

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- Formal trial

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- Video capture

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- Increase conversation between AI avatar and human

Looking to the Future

- Formal trial
- Video capture
- Increase conversation between AI avatar and human
- Change the game - Poker?

References I

[1] SCHRODER, M., BEVACQUA, E., COWIE, R., EYBEN, F., GUNES, H., HEYLEN, D., TER MAAT, M., MCKEOWN, G., PAMMI, S., PANTIC, M., ET AL.
Building autonomous sensitive artificial listeners, 2012.

[2] TAO, J., AND TAN, T.
Affective computing: A review.
In *Affective Computing and Intelligent Interaction*, J. Tao, T. Tan, and R. Picard, Eds., vol. 3784 of *Lecture Notes in Computer Science*. Springer Berlin Heidelberg, 2005, pp. 981–995.