

Watch your tongue:

A point-tracking visualisation system in Blender

Kristy James¹⁻³ Ingmar Steiner^{1,3} Martijn Wieling² Alexander Hewer^{1,3} Angelika Braun⁴

¹Computational Linguistics & Phonetics
and MMCI, Saarland University

³DFKI Language Technology Lab

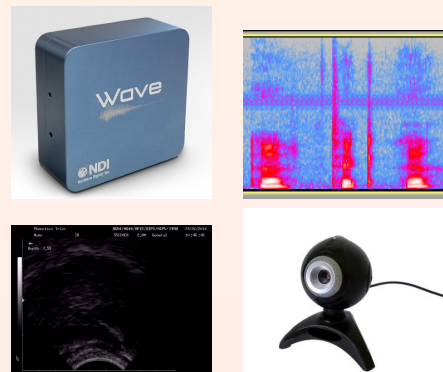
²Information Science,
University of Groningen

⁴Phonetics, University of Trier

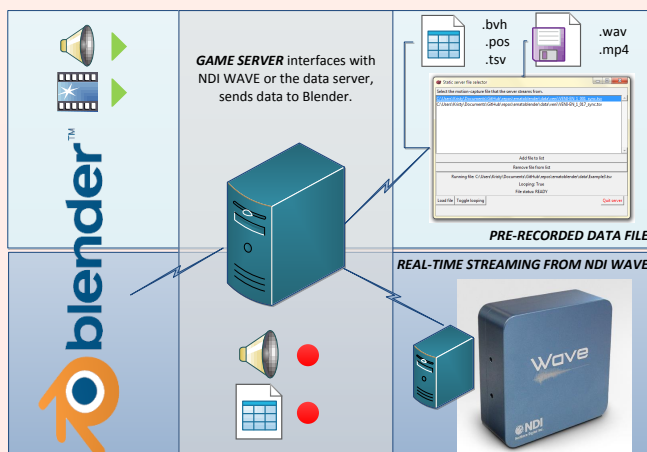
Capabilities

- Reads in EMA data from NDI WAVE or from many pre-recorded file types
- Manipulates the positional data in intermediate server (eg. head-correction, filtering, delay)
- Displays point-tracking data in Blender Game Engine
- Moves articulator 'rigs' and uses game controls for intuitive use and interpretation

Multi-modal inputs



System Architecture



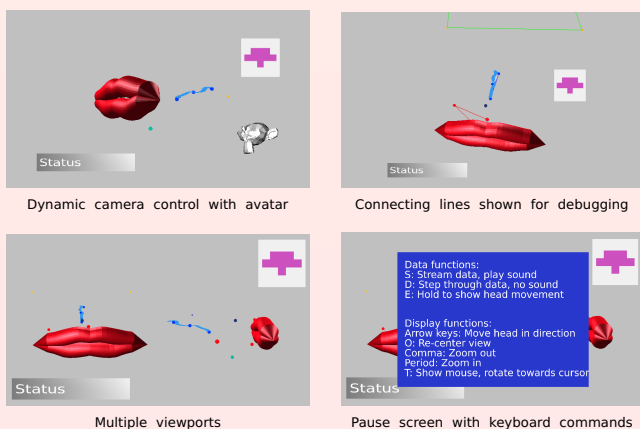
Data manipulation for research

- Turn head-correction on/off
- Filter, transform or delay before displaying
- Play pre-recorded trajectories

Gamification in Blender

- Overlay videos of ultrasound/webcam/goal articulation into game
- Use GUI/Python to set obstacles/goals
- Visual manipulations such as hiding or high-lighting elements

Screenshots



EMA for speech feedback

- English speakers learning Japanese (June S. Levitt and William F. Katz. "The effects of EMA-based augmented visual feedback on the English speakers' acquisition of the Japanese flap: a perceptual study". In: *Proc. Interspeech*. 2010)
- Japanese speakers learning English (Atsuo Suemitsu, Takayuki Ito, and Mark Tiede. "An electromagnetic articulography-based articulatory feedback approach to facilitate second language speech production learning". In: *Proc. of Meetings on Acoustics*. 2013)
- Optispeech (William Katz et al. "Opti-Speech: A Real-Time, 3D Visual Feedback System for Speech Training". In: *Proc. Interspeech*. 2014)
- Differences between L1 and L2 pronunciation trajectories (Martijn Wieling et al. "Comparing L1 and L2 speakers using articulography". In: *Proc. 18th International Congress of Phonetic Sciences*. 2015)