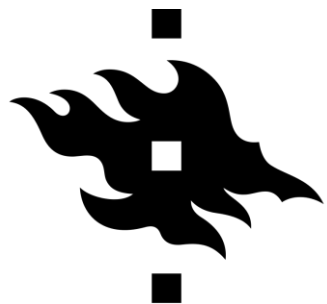


Disordered speech in children with autism spectrum disorders

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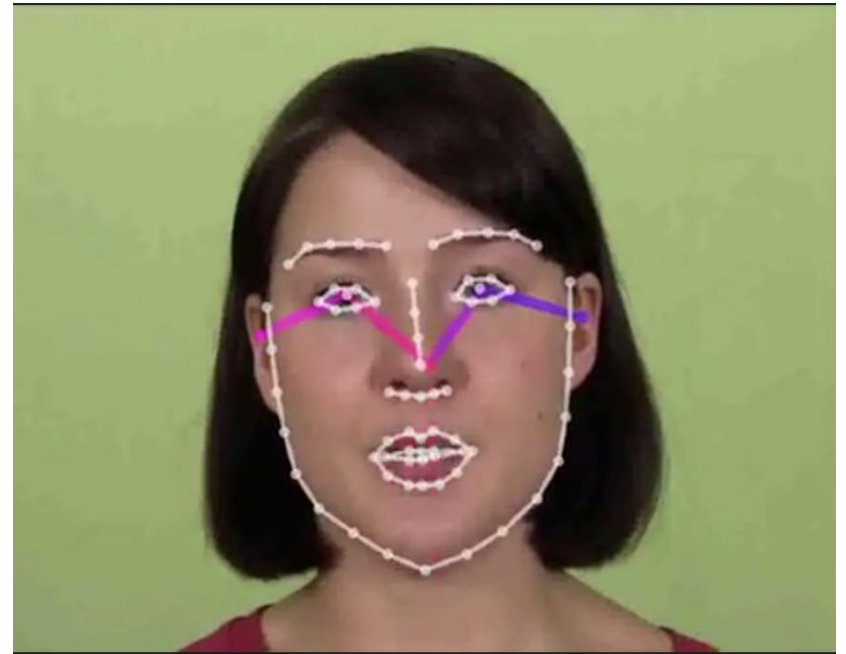
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Multimodal perspective

- Multimodal perception of speech in autism spectrum disorders (Saalasti et al., 2011; Saalasti et al., 2012)
- Brain mechanisms (fMRI) underlying lipreading, reading and listening a narrative
 - Naturalistic neuroscience:
 - novel analysis methods
 - enable studying near real-life stimuli, requires stimulus models
 - (eg. Inter-subject correlation, Hasson et al., 2004; Kauppi et al., 2010; Saalasti et al., submitted)



ASD

Autism Spectrum Disorders:

- Restricted interests and routines, impaired social interaction (DSM-5, APA, 2013)
 - Early signs and changes difficult to detect quantify
- AIM: To develop automatic ways to analyze social communication skills in children with autism from real-life data

Disordered speech in ASD

Disordered speech in ASD:

- Atypical prosody (McCann & Peppé, 2003, Paul et al., 2005, Peppé et al., 2011)
 - Atypical cry acoustics in children at risk (Sheinkopf et al., 2012)
 - Acoustic analysis of prosody in ASD (Bölte, et al., 2010)
- Apraxia of speech
 - Inability to produce speech sounds would explain lack of speech (Shriberg et al., 2011)

Methods:

Participants:

- Piloting in progress
- N = 50 typically developed children (18 – 36 months) to train machine learning algorithms
- N = 30 children with ASD (18 – 36 months) + matched controls
- Psychometric data from the hospital
 - ADI-R (Le Couter, Lord, & Rutter, 2003), ADOS (Lord et al. 2003)
 - MCDI (Finnish version Lyytinen, 1999)
 - Other tests (WISC, RDLSIII), when applicable

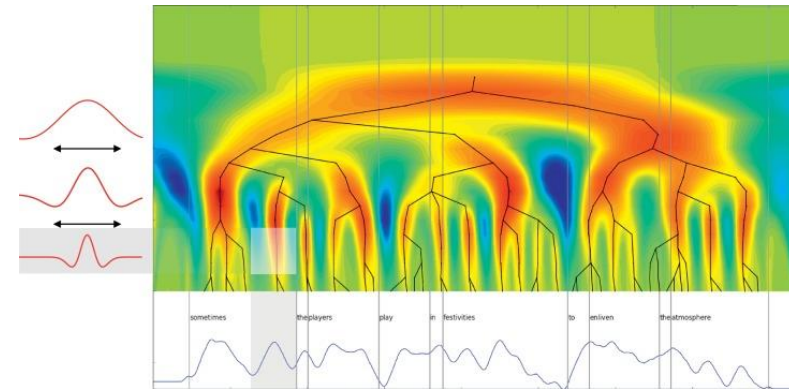
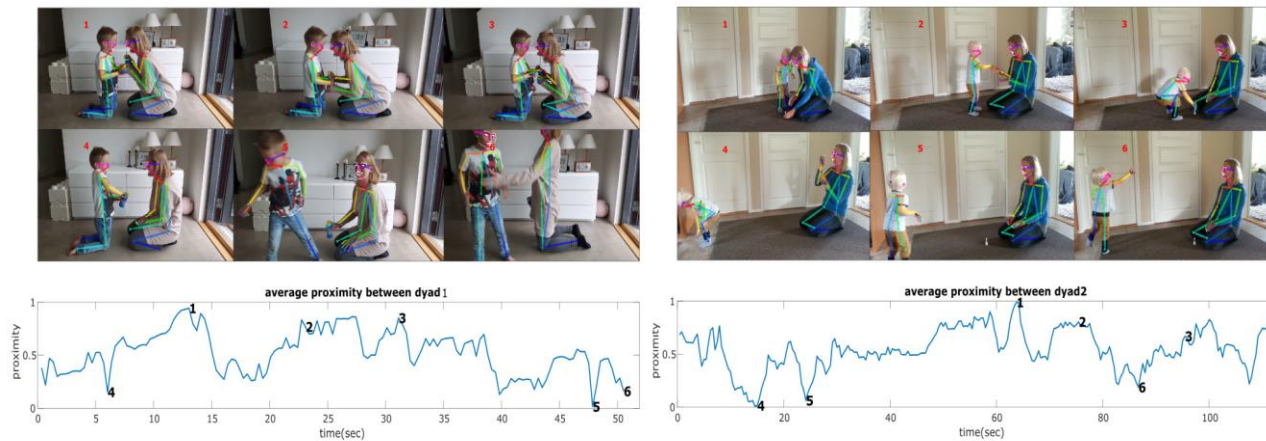
Multimodal real-life data:



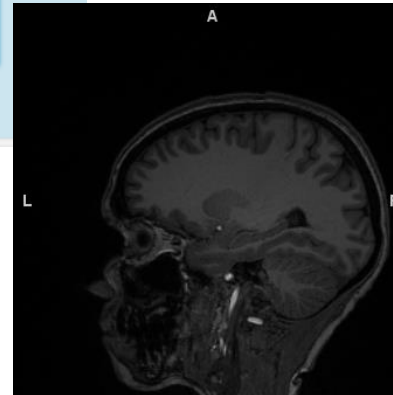
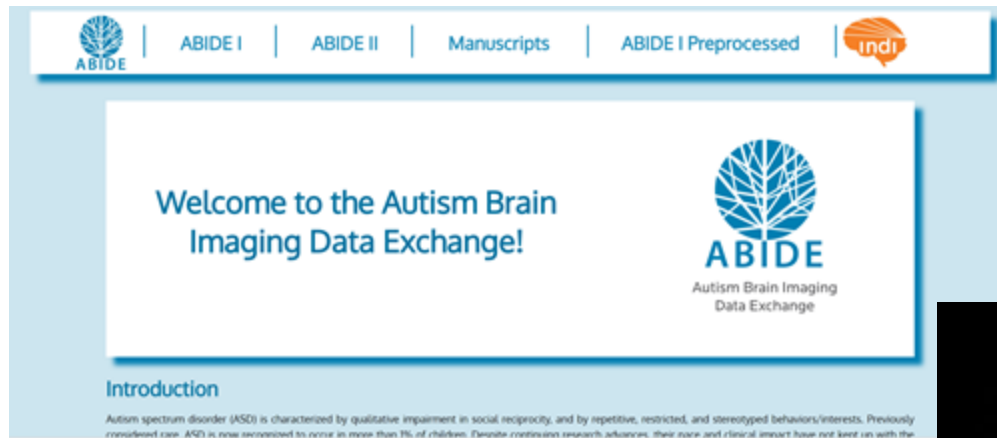
Data-analysis:

Data driven computational methods extracting:

- Acoustic-prosodic features (wavelett analysis. Suni et al., 2017)
- Motion (facial and gestural)

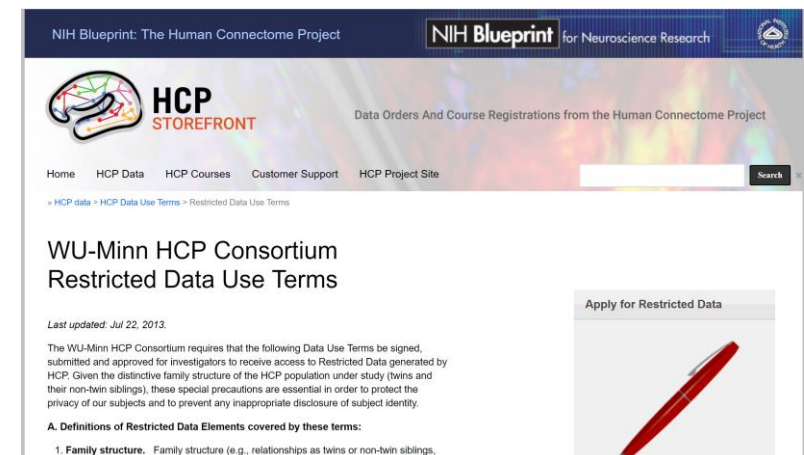


Data sharing:



Questions:

- Ethical permission for sharing sensitive data?
- Data format (original videos/audiofiles or timeseries?)
- Annotations?



Collaborators:

- Prof Mikko Sams, Department of Neuroscience and Biomedical Engineering, Aalto University
- Prof Martti Vainio, Digital Humanities, University of Helsinki
- Post Doc, Dr Sci Enrico Glerean; NBE, Aalto University
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- Neuropsychologist, Dr Tuulia Lepistö