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Prediction of neurodevelopmental disorders in young children using multi sensory data analysis

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Problem formulation

- **Neurodevelopmental disorders in children**
 - Cerebral palsy (CP), autism spectrum disorder (ASD), fragile X syndrome (FXS), Rett syndrome (RTT)
- **Problems**
 - Assessment via visual observation, ratings of experts are subjective
 - ASD, RTT, FXS detection at a very early stage is not well explored
- **Project contributions**
 - **Improved early detection** of neurodevelopmental disorders in young children **to enable early intervention**

Proposed approach

- **Multi-modal sensory recordings**

- Multi-camera recordings (7 cameras)
- Audio recordings
- Pressure mattress data

- **Marker-less full body tracking**

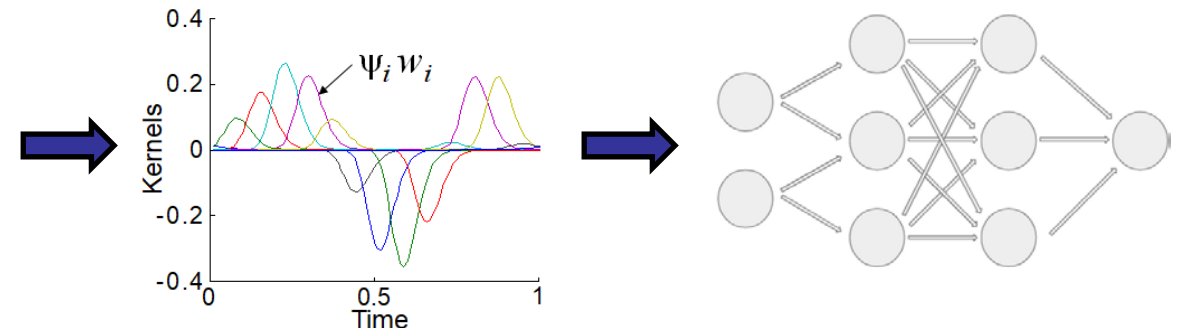
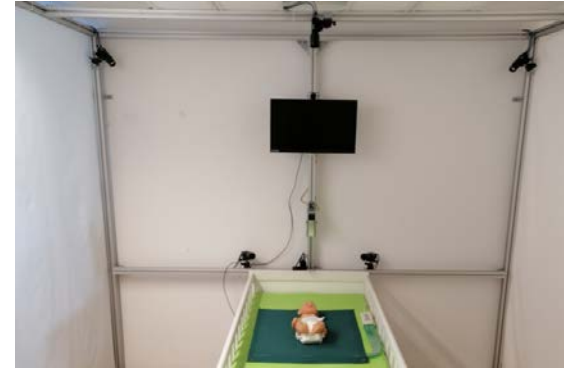
- DeepLabCut, OpenPose

- **Movement encoding**

- Dynamic movement primitives (DMPs)

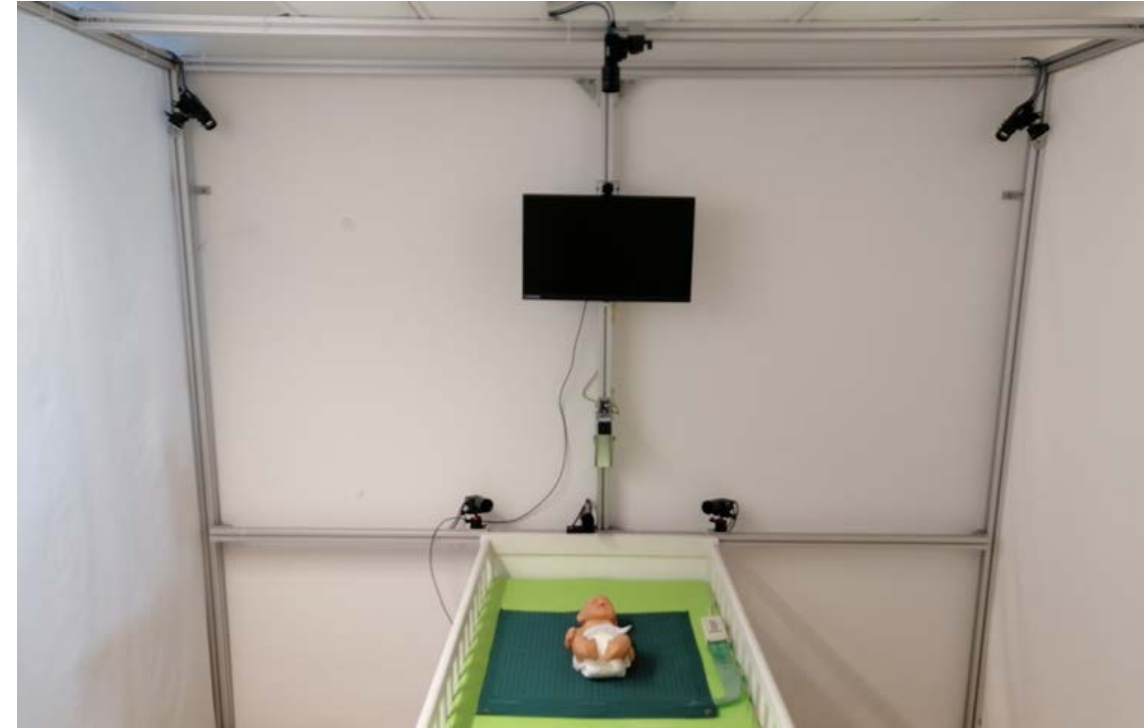
- **Movement recognition**

- Artificial neural networks (ANNs)



Data (to be collected)

- **30 participants**
- **11 recording sessions**
- **~35 GB per session**
- **Total: $30 \times 11 \times 35 \text{ TB} = 11.55 \text{ TB}$**



We need

- **Data storage**

- Data storage with backups (~400 TB)
- Access to data (upload/download)
- Security (user sensitive data)



- **GPUs for motion, face, and gaze tracking, and data analysis**

- ~3 GPUs



Thank you!

