Delineating the whole brain BOLD response to passive movement kinematics

J Sulzer, J Dueñas, R Gassert: Swiss Federal Institute of Technology (ETHZ)
MC Hepp-Reymond, S Kollias: University of Zurich (UZH)
P Stämpfli, E Seifritz: Zurich University Hospital for Psychiatry (PUK)

- Neural response to passive movement kinematics has not been addressed
- Stimulated forefinger using MR compatible manipulator at varying velocities and amplitudes
- Found differential representation in sensorimotor network

Podium 6.1

Exploiting Accelerometers to Improve Movement Classification for Prosthetics

- Accelerometers are highly informative for hand and arm movement classification

- Accelerometry is complementary to sEMG and combining both modalities with kernel averaging in a multi-modal classifier increases performance

- Improvement from including accelerometry is consistent over all movement classes and over the entire movement duration

Podium 6.2
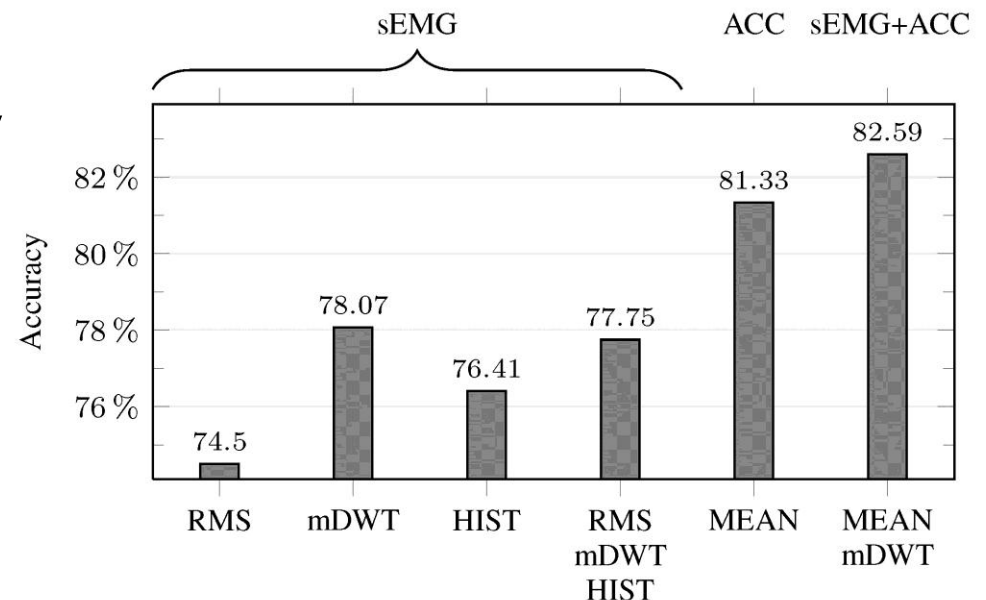
Impact of Robot-mediated Interaction System on Joint Attention Skills for Children with Autism

Zhi Zheng, Lian Zhang, Esubalew Bekele, Amy Swanson, Julie A. Crittendon, Zachary Warren, Nilanjan Sarkar: Vanderbilt University, USA

- This is a study of the development and application of an innovative adaptive robotic system with potential relevance to core areas of deficit in young children with ASD.

- This system empirically evaluates the usability, feasibility, and preliminary efficacy of an adaptive interactive robotic technology capable of modifying performance regarding joint attention skills for young children with ASD.

- The result shows participant's performance improved with more exposure, and eye gaze data analysis shows participants' initial attentional bias and preference to robot held over time.

Podium 6.3
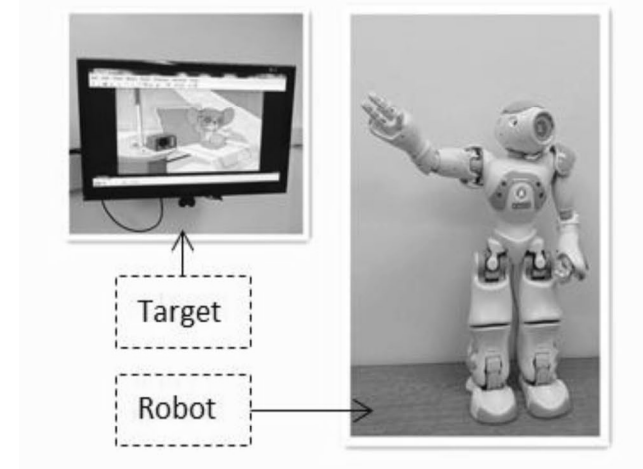
Individual patterns of motor deficits evident in movement distribution analysis

Felix C. Huang & James L. Patton
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- We explored how to quantify and interpret exploratory movement patterns using statistical distributions of movements.

- In a test on 10 chronic stroke subjects practicing for 3 days, we found that inter-quartile range of motion did not show improvement.

- Multivariate Gaussian fit measures the complexity

- Linear discriminant analysis classification of each patient's movement distribution also identified that each patient's motor deficit left a unique signature.

- The greatest distinctions were observed in the space of accelerations (rather than position or velocity).

- These results suggest that unique deficits are best detected with such a distribution analysis, and also point to the need for customized interventions that consider such patient-specific motor deficits.

Podium 6.4