基礎研究

N17 脳情報科学

Neuroergonomics Approach to Investigate Dynamic Whole-Body Movement
～Toward Development of Cyborg Skateboarding～

概要

Neuroergonomics is the investigation of human brain function in real world situations to promote development of technology to enhance performance and wellbeing. The goal of this research is to utilize a neuroergonomics approach to better understand brain and biomechanical process underlying dynamic whole-body movement in real-world as opposed to constrained laboratory settings. Insights from this research can be used in part to facilitate development of Cyborg AI for control of avatars and androids.

特徴

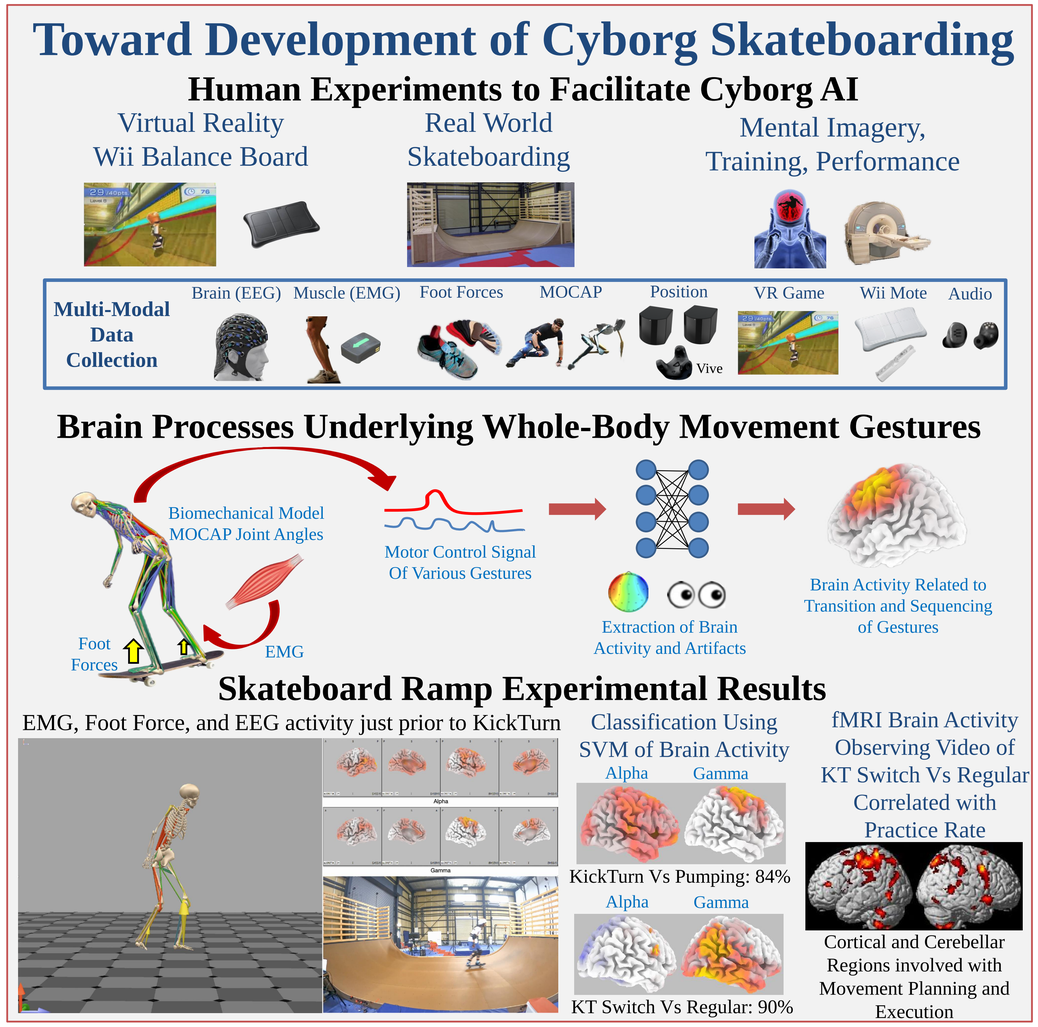
- This research utilizes synchronized acquisition and synthesis of multiple modalities including whole body motion capture, multi-channel foot force, EMG muscle activity, and EEG brain activity to investigate transitions and dynamics of gestural synergies.
- Skateboarding lends itself well to a neuroergonomic investigation of whole-body movement. Skateboarding is a dynamic task requiring transition and sequencing of multiple whole-body gestural synergies. The skateboard functions as a tool that requires that it becomes an extension of ones body.
- Motor control signals underlying the execution of various gestural synergies based on a whole-body biomechanical model incorporating EMG and foot forces is used to identify brain processes involved with transition and sequencing of coordinated movement.

今後の展開

- The future objective is to process neural activity associated with shifts to and from different gestural synergies in almost real time. This would enable the utilization of AI-integrated biomechanical and brain processing feedback to augment human training and performance, culminating in the actualization of Cyborg AI.

テーマ「ともに究め、明日の社会を拓く」との関連

- Cyborg AI can be developed based on an individual's biomechanical specifications such that a simulated avatar can help facilitate training and learning on various whole-body tasks as well as in rehabilitation after injury. In addition, this research can help promote more flexible and adaptive sequencing and transitioning of synergistic gestures in robots facilitating creativity and the ability to work hand-in-hand with humans pioneering tomorrow's society.



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