Title: **Sensorimotor Learning for Control of Prosthetic Hands**

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Abstract

Acquiring a new skill, for example learning to use chopsticks, requires accurate motor commands to be sent from the brain to the hand, and reliable sensory and visual feedback to the brain. Over time and with training, the brain learns to handle this two-way communication flexibly and efficiently. Inspired by this sensorimotor interplay, our research at Intelligent Sensing laboratory in Newcastle University is guided by a conviction that progress in prosthetic limb control is best achieved through a strong synergy of motor learning and feedback. We therefore study the interaction of neural and behavioural processes that control the hand movements to ultimately innovate prosthetic control solutions that users would find fit for purpose. At TIPS2019, we will provide corroborating evidence from several parallel studies that show with training participants can improve their performance in biofeedback myoelectric control tasks, within a short period, regardless of the level of the intuitiveness of the myoelectric control space. We therefore will emphasise the important role that sensorimotor learning and user adaptation can play in enhancing the myoelectric control of prosthetic hands [Dyson et al. 2018]. In addition, we will share our early results on the development of flexible inter-neuronal electrodes to directly interface with the nervous system for provision of sensory feedback.

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References

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