Scientific/Clinical Workshop

Workshop Title

Computational Modeling of Movement Control for Bionic Limbs and Hands

Workshop Responsible

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Speakers

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Abstract

The next generation of prosthetic hand is obliged to transcend the functionality provided by existing products. Key to this goal is the pursuit of bio-realism on prosthetic hands for a natural, intuitive, and performant device. For example, human hand has compliant properties arising from muscle biomechanics and neural reflexes, which is absent in conventional prosthetic hands. Therefore, one way of achieving bio-realism is the modeling and emulation of human reflex on tendon-driven prosthetic hands. This synthetic approach requires a thorough understanding of human motor control, cybernetic control, and the comparative differences between them. This workshop will present development of technologies from a wide range of disciplines that address this challenge, from active materials, to nano-micro sensors, non- invasive natural tactile feedback, motion intention recognition from high-density EMG, model-based neuromorphic control, and so on. The bio-inspired and model-based intellience embedded in the prosthetic hands may promote positive change in the amputeeâ€™s brain for a better embodiment. The goal is to present a new view to such multi-disciplinary research for the advancement of technologies in neuroprosthetics.