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ON

Brain/Neural Assistive Technologies

Editor-in-Chief:

Prof. Hojjat Adeli

The Ohio State University, Columbus, Ohio, U.S.A. (Email: Adeli.1@osu.edu)

Guest Editors:

Prof. Yasuharu Koike, Ph.D.,

Tokyo Institute of Technology, Tokyo, Japan (Email: koike@pi.titech.ac.jp)

Prof. Loredana Zollo, Ph.D.,

Università Campus Bio-Medico, Rome, Italy

(Email: l.zollo@unicampus.it)

Prof. Surjo R. Soekadar, M.D.,

Charité – University Medicine Berlin, Berlin, Germany (email: surjo.soekadar@charite.de)

koike@pi.titech.ac.jp; l.zollo@unicampus.it; surjo.soekadar@charite.de

According to the World Health Organization (WHO) about 15% of the world population suffer from a disability limiting their ability to perform basic Activities of Daily Living (ADL). Use of neural-assistive technologies provides great potential for these individuals to regain independence and social participation. Moreover, advancements in the fields of artificial intelligence, machine learning and neurorobotics allow now for the development of novel human-machine interaction strategies. The most challenging aspects in the development and translation of neural-assistive technologies into real-world applications are related to the interaction design between computational and complex biological systems. Besides having to account for the neural system's adaptive capacity and plasticity posing a potential resource towards neurorestoration and neuroregeneration, the system should be customizable to the user's specific abilities and needs.

This special issue focuses on the latest advances in neural-assistive technologies including systems and strategies for monitoring, reconstructing and integrating user state and intention during adaptive human-machine interaction. Topics of interest include:

- User intention detection from neural and peripheral physiological signals
- Brain signal decoding
- User state estimation
- Brain-computer interfaces (BCI) for human-robot interaction (HRI)
- Brain/neural-machine interfaces (B/NMI) for motor control and neurorehabilitation
- Assistive neurorobotics, prosthetics and biomechanics
- Robot-aided rehabilitation to trigger neuroplasticity, neurorestoration and neuroregeneration
- Closed-loop sensory feedback and neuromodulation

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