

Neurocognitive rehabilitation approach for cerebral palsy syndrome by using the rhythm-based tapping tool to extend fields of perception and motion

M Fukudome¹, H Wagatsuma^{1,2}, K Tachibana³, K Sakamoto⁴

¹Department of Brain Science and Engineering, Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology, 2-4 Hibikino, Wakamatsu-Ku, Kitakyushu, JAPAN

²RIKEN Brain Science Institute, 2-1 Hirosawa, Wako, Saitama, JAPAN

³Department of Physical Therapy, School of Health Sciences, Ibaraki Prefectural University of Health Sciences, 4669-2 Ami, Ami-Machi, Inashiki-Gun Ibaraki 300-0394 JAPAN

⁴Research Institute of Electrical Communication, Tohoku University
2-1-1 Katahira, Aoba-ku, Sendai 980-8577, JAPAN

fukudome-marie@edu.brain.kyutech.ac.jp, waga@brain.kyutech.ac.jp, tachibana@ipu.ac.jp, sakamoto@riec.tohoku.ac.jp

¹www.kyutech.ac.jp, ²www.riken.go.jp, ³www.ipu.ac.jp, ⁴www.riec.tohoku.ac.jp

ABSTRACT

We focus on the difficulty of children with cerebral palsy to perform not only motor skills but also cognitive tasks, and hypothesize that rhythm-based tapping tasks help to enhance abilities of motions and cognitions cooperatively, if a personally-tailored rhythm is provided. In the experiment with the prototype tapping device, we found that a misalignment of the pacemaker with the internally-comfortable tempo brings subjects a feeling of discomfort and declination of performance if the task is in a rushed condition. This result suggests that a self-motivated rhythm may be enhanced through synchrony with the external rhythm, while it is disturbed by a gap between internal and external rhythms. This is an important step towards developing a rhythm-based rehabilitation method and a design principle focusing on subjects' individual internal rhythms.

Full papers will be published in the Conference Proceedings and will be available to delegates at the conference on Sept. 10.

Full papers will be released on-line in the ICDVRAT archive on March 15.