Multichannel magnetic stimulation device for brain research

Title of the dissertation
Implementing advanced transcranial magnetic stimulation technology

Contents of the dissertation
Transcranial magnetic stimulation (TMS) is a relatively young method for non-invasive brain stimulation. TMS has found use from basic brain research to clinical applications. In TMS, a large, suitably shaped electromagnet induces localised activation of a desired target in the cortex; TMS has better than centimetre-scale spatial resolution and millisecond-scale temporal resolution. The combined spatiotemporal resolution is, however, limited: to change the locus of stimulation, the electromagnet must be moved.

The aim of this thesis was to solve the problem with limited spatiotemporal resolution. This aim was met by designing and implementing a multichannel TMS device with which the locus of stimulation could be controlled electronically within a limited region. The described method can be applied to improve the TMS-based brain research and clinical applications in the future.

Field of the dissertation
Biomedical Engineering

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Aalto University School of Science, auditorium F239a, Otakaari 3, Espoo

Opponent
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