Subproject 1

Subject Preparation:
– EEG preparation (15-30 min.)
– EMG preparation (10 min.)
– Electrical and/or mechanical stimulation setup (10 min.)
– TMS hotspot recording (10 min.)

Time: 45 minutes – 1 hour

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Baseline measurements:
– Subject performs 50 real movements of foot while EEG is recorded (10 min.)
– BCI trained on subject specific cortical potentials
– Subject instructed in motor imagination
– TMS baseline motorthreshold (5 min.) and 120% motor threshold stimulations (15 stimuli) recorded (5 min.)

Time: 20 minutes

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Intervention:
– Subject performs 50 true postitive movements as recorded by BCI interface
– Intervention is either:
Electrical stimulation of CPN
Mechanical stimulation of ancle joint
Both electrical and mechanical stimulation

Time: 10 minutes

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Post measurement:
– TMS 120% motor threshold stimulation (15 stimuli)

Time: 5 minutes

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Post 30 minutes measurement:
– TMS 120% motor threshold stimulation (15 stimuli)

Time: 5 minutes
Total time ~ 2 hours

Subproject 2

Subject Preparation:
– EEG preparation (15-30 min.)
– EMG preparation (10 min.)
– Best recorded outcome of subproject 1:
Electrical and/or mechanical stimulation setup (10 min.)

Time: 35 minutes – 50 minutes

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Subject randomly allocated to coherence or TMS used as quantification tool and the other method later

Coherence

Baseline measurements:
– Subject performs 50 real movements of foot while EEG is recorded (10 min.)
– BCI trained on subject specific cortical potentials
– Subject instructed in motor imagination
– Coherence baseline recorded (30 real movement dorsiflexions) (10 min.)

Time: 20 minutes

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Intervention:
– Subject performs 50 true postitive movements as recorded by BCI interface
– Intervention is either best outcome of subproject 1

Time: 10 minutes

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Post measurement:
– Coherence (30 real movement dorsiflexions)

Time: 10 minutes

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Post 30 minutes measurement:
– Coherence (30 real movement dorsiflexions)

Time: 10 minutes
Total time ~ 2 hours

TMS

Baseline measurements:
– Subject performs 50 real movements of foot while EEG is recorded (10 min.)
– BCI trained on subject specific cortical potentials
– Subject instructed in motor imagination
– TMS hotspot, resting motorthreshold, and 120% motorthreshold recording (20 min.)

Time: 30 minutes

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Intervention:
– Subject performs 50 true postitive movements as recorded by BCI interface
– Intervention is either best outcome of subproject 1

Time: 10 minutes

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Post measurement:
– TMS 120% motor threshold stimulation (15 stimuli)

Time: 5 minutes

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Post 30 minutes measurement:
– TMS 120% motor threshold stimulation (15 stimuli)

Time: 5 minutes
Total time ~ 2 hours