

AUI 2016

Playing Air Guitar by Electrical Muscle Stimulation

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Air Guitar

a form of dance and movement in which the performer pretends to play **an imaginary guitar.**

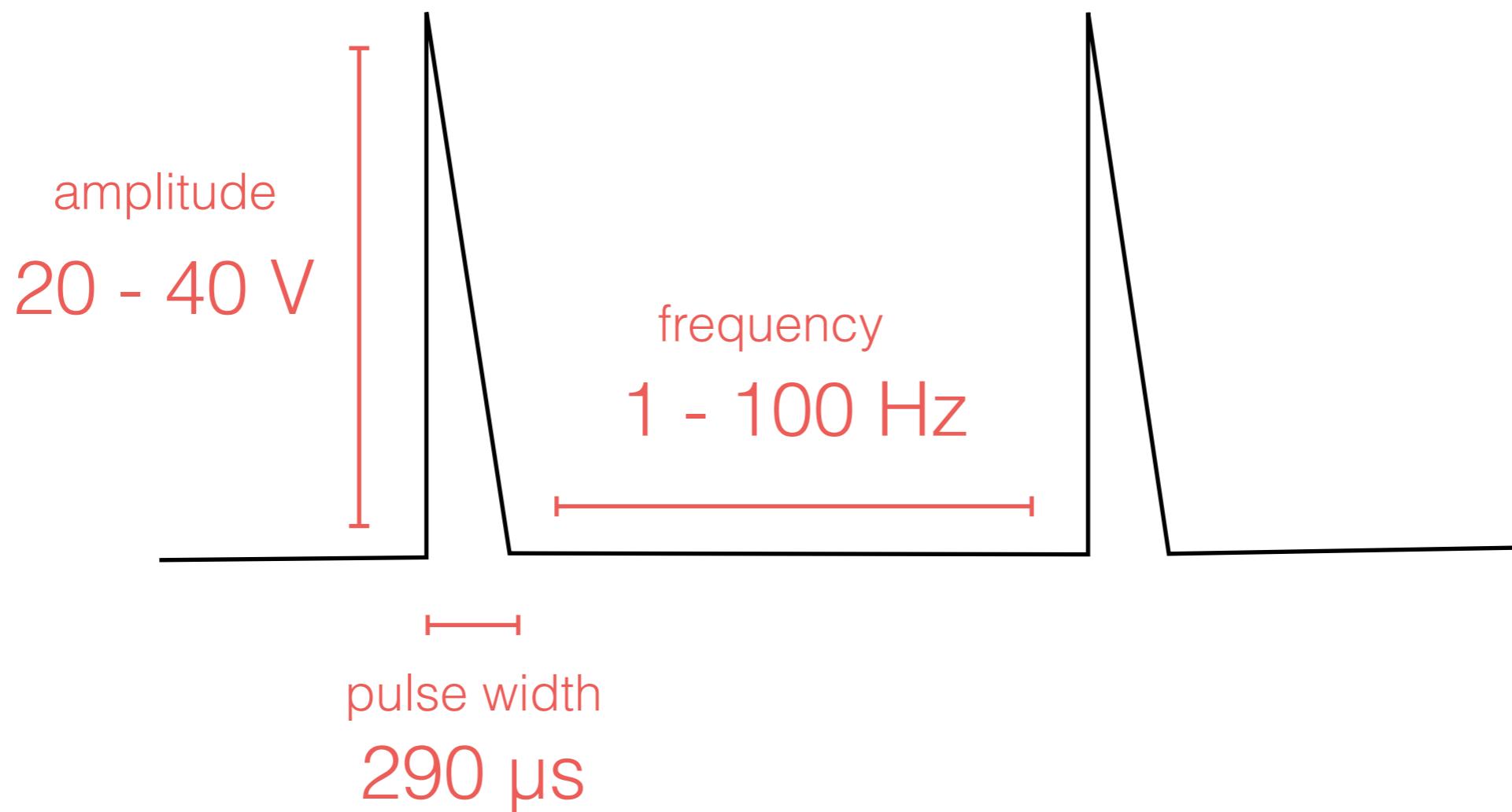


- body coordination
- sense of groove
- imaginations

**Could we help
people play?**

Electrical Muscle Stimulation (EMS)

The elicitation of muscle contraction using electric impulses, usually used for rehabilitation.





EMS Air Guitar

An air guitar assistant which **stimulate** your muscle to move with the **rhythm** of the music.

Related Work

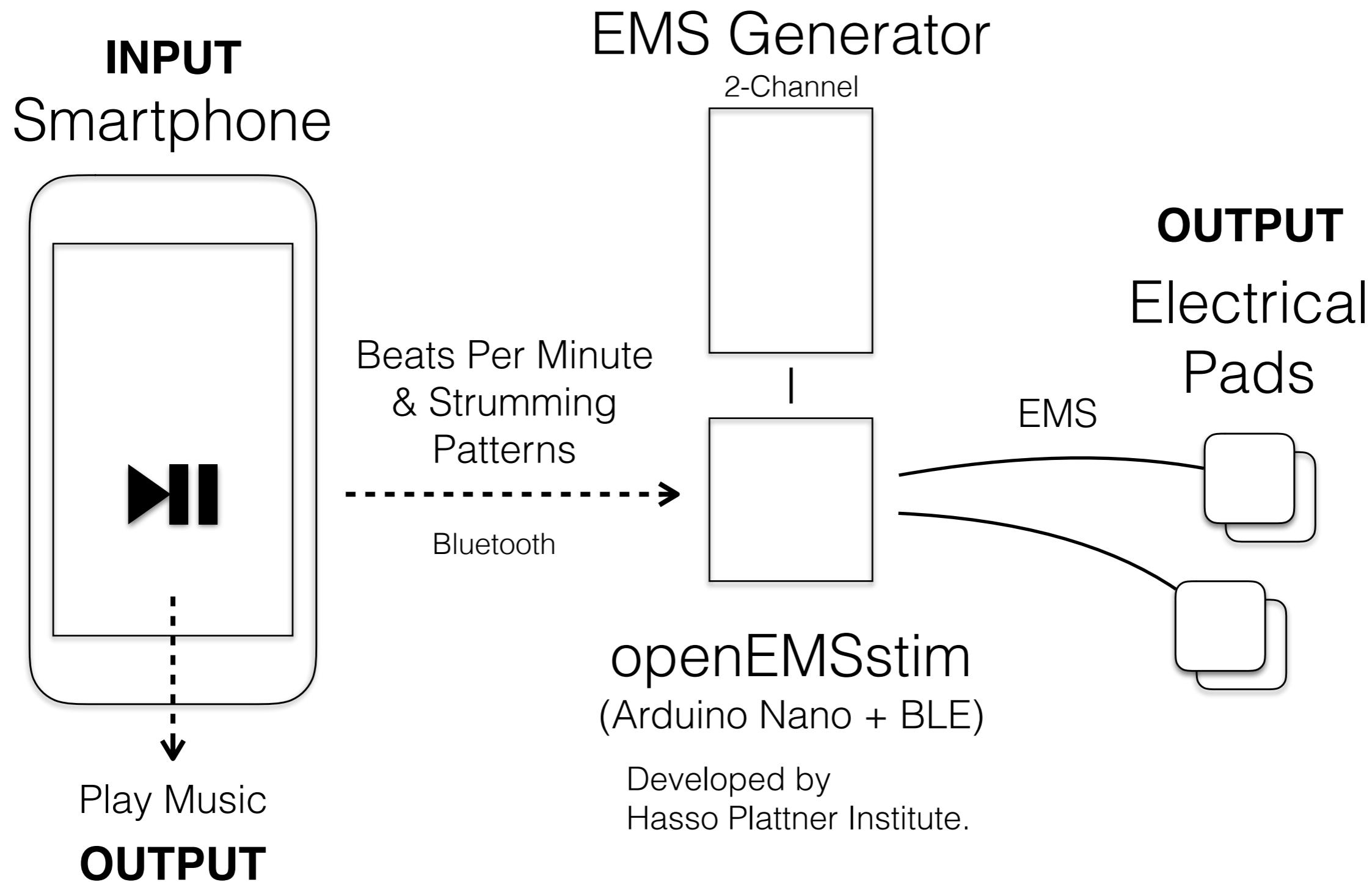
Emi Tamaki, Takashi Miyaki,
and Jun Rekimoto.

**PossessedHand: techniques
for controlling human hands
using electrical muscles
stimuli.** CHI '11.



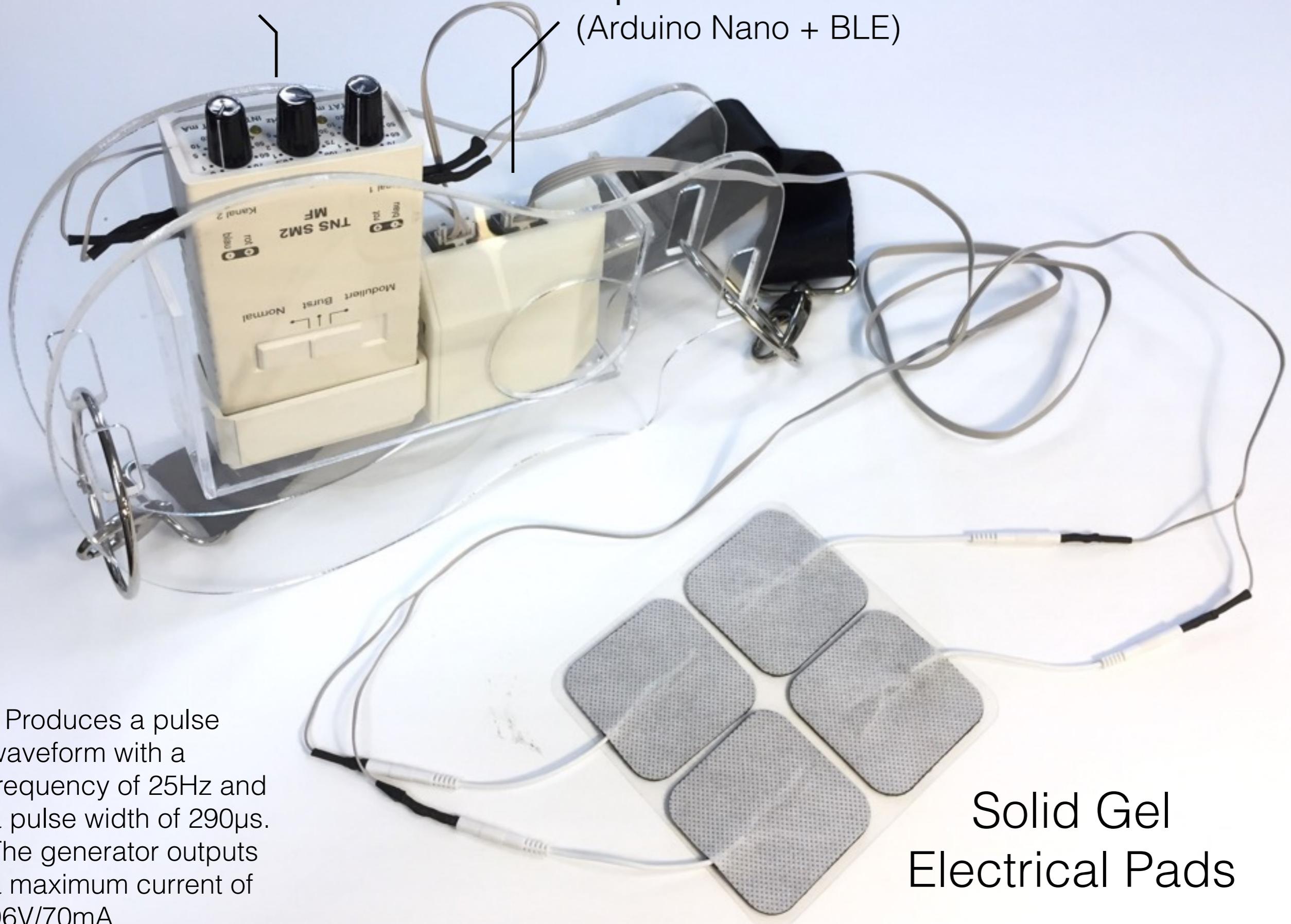


Implementation (Wireless Version)



TNS SM 2 MF*

openEMSstim
(Arduino Nano + BLE)



* Produces a pulse waveform with a frequency of 25Hz and a pulse width of 290 μ s. The generator outputs a maximum current of 96V/70mA.

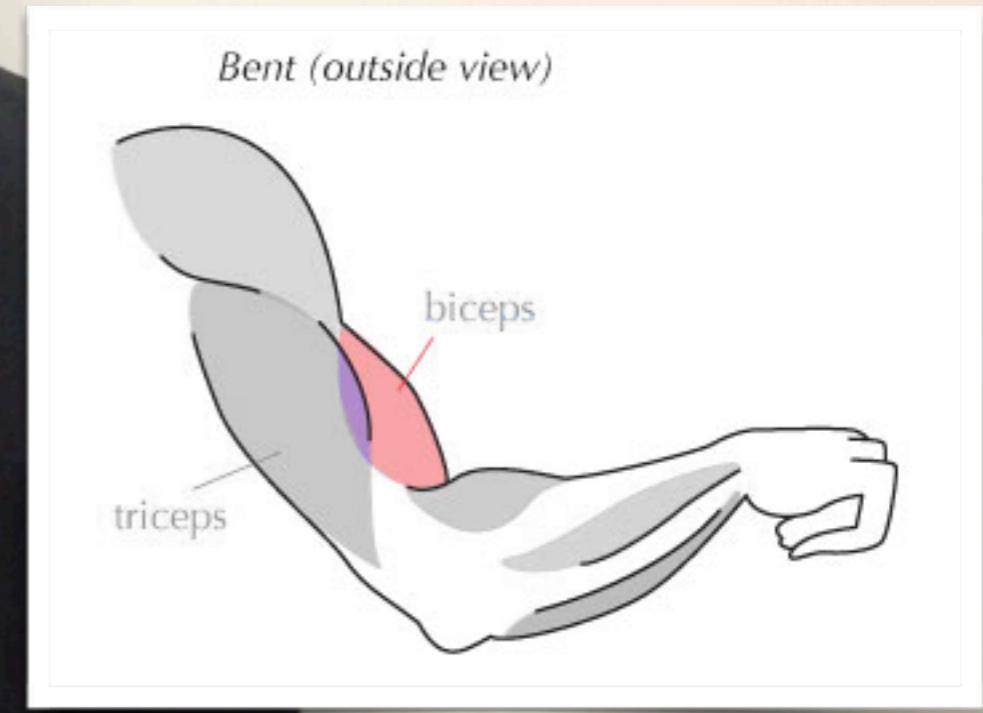
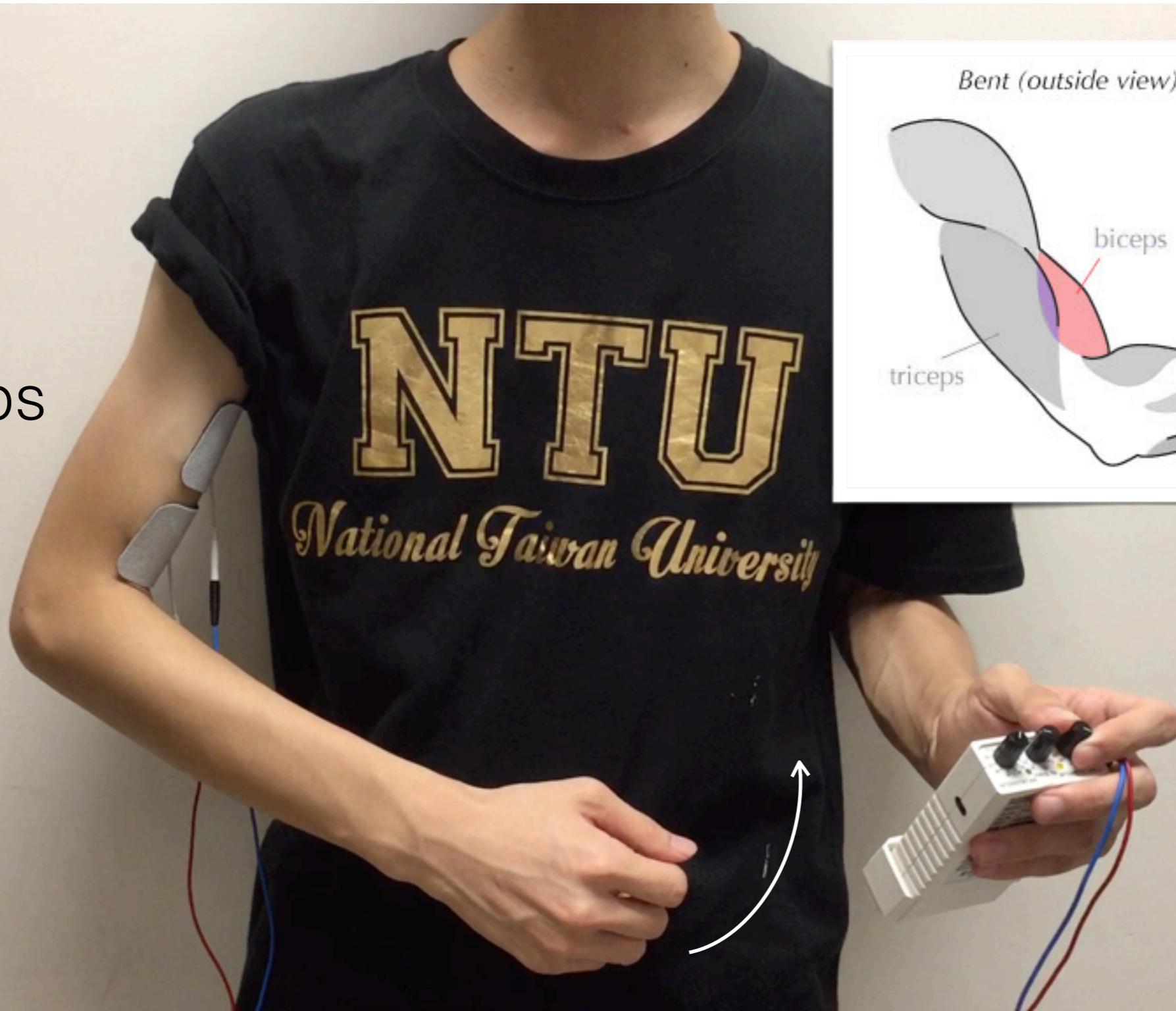
Solid Gel
Electrical Pads



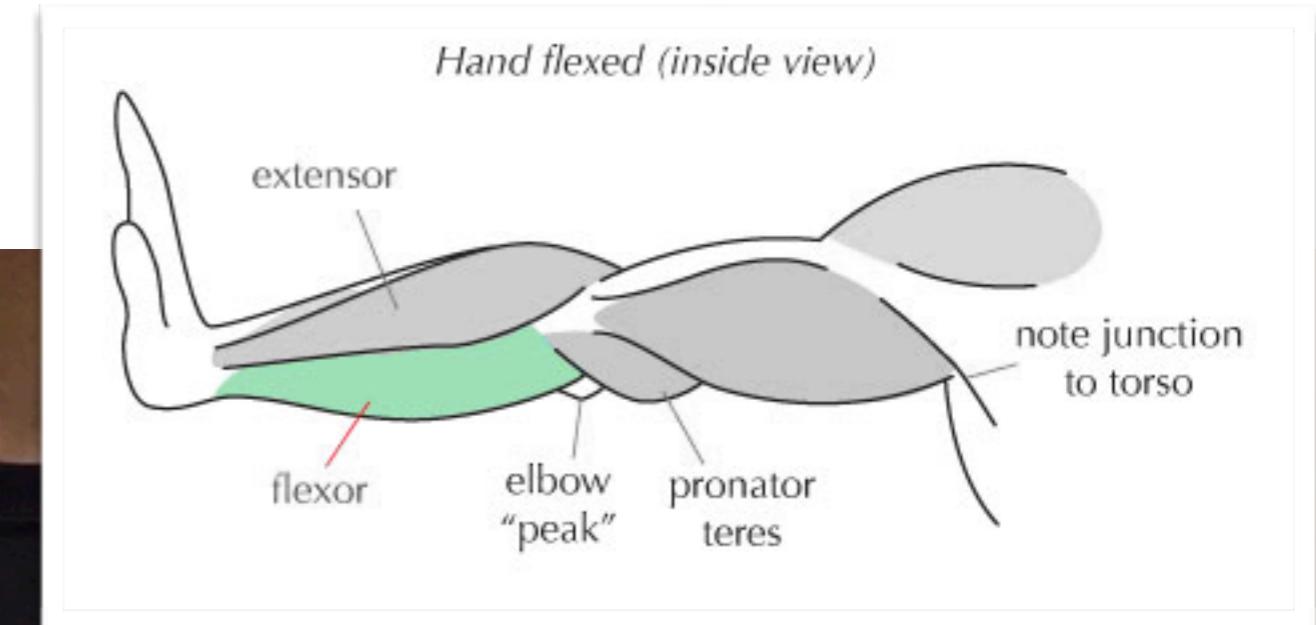
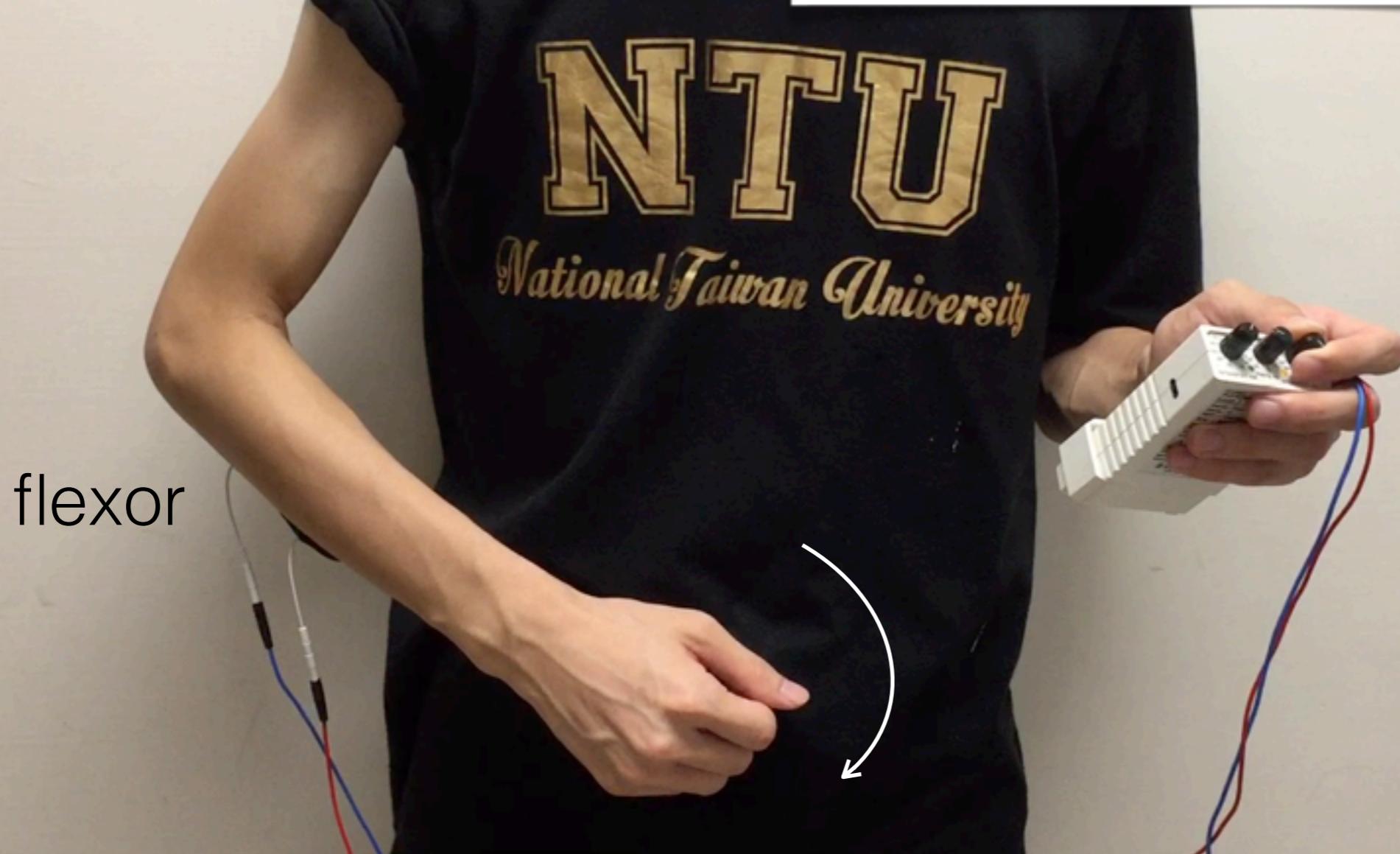
Android App
Play music
Sync movements

Heavy strumming

biceps



Light strumming



User Feedback

6 lab participants (3 female) age 22-23

“I feel more immersive when moving my arm automatically when listening to the music.”

“I feel more free and relaxed when playing air guitar with EMS.”

“I feel better because I know that I’m doing it right.”

- *EMS Air Guitar gives people an opportunity to express themselves who don't know how to play a guitar or dance*

User Feedback

“The EMS movement sometimes differs from my expectation.”

- *when the arm bends, the muscle slips under the skin*

User Feedback

“I would like to get the precise guitar rhythm and to remember the place of my hand during my guitar performance.”

- *the time when EMS starts and the time muscle moves should be calibrated to synchronized for each participant*

User Feedback

“I would like to experience more special movement.”

- *more channels and calibration needed*

UIST 2016 Student Innovation Competition (SIC)

Shan-Yuan Teng, Yung-Ta Lin, Yi-Chi Liao



五月天 (Mayday)
戀愛 ING (LOVE-ING)

feat. Prof. Patrick Baudisch





Perfume Cosmic Explorer

feat. Prof. Jun Rekimoto



Thanks for listening!



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