

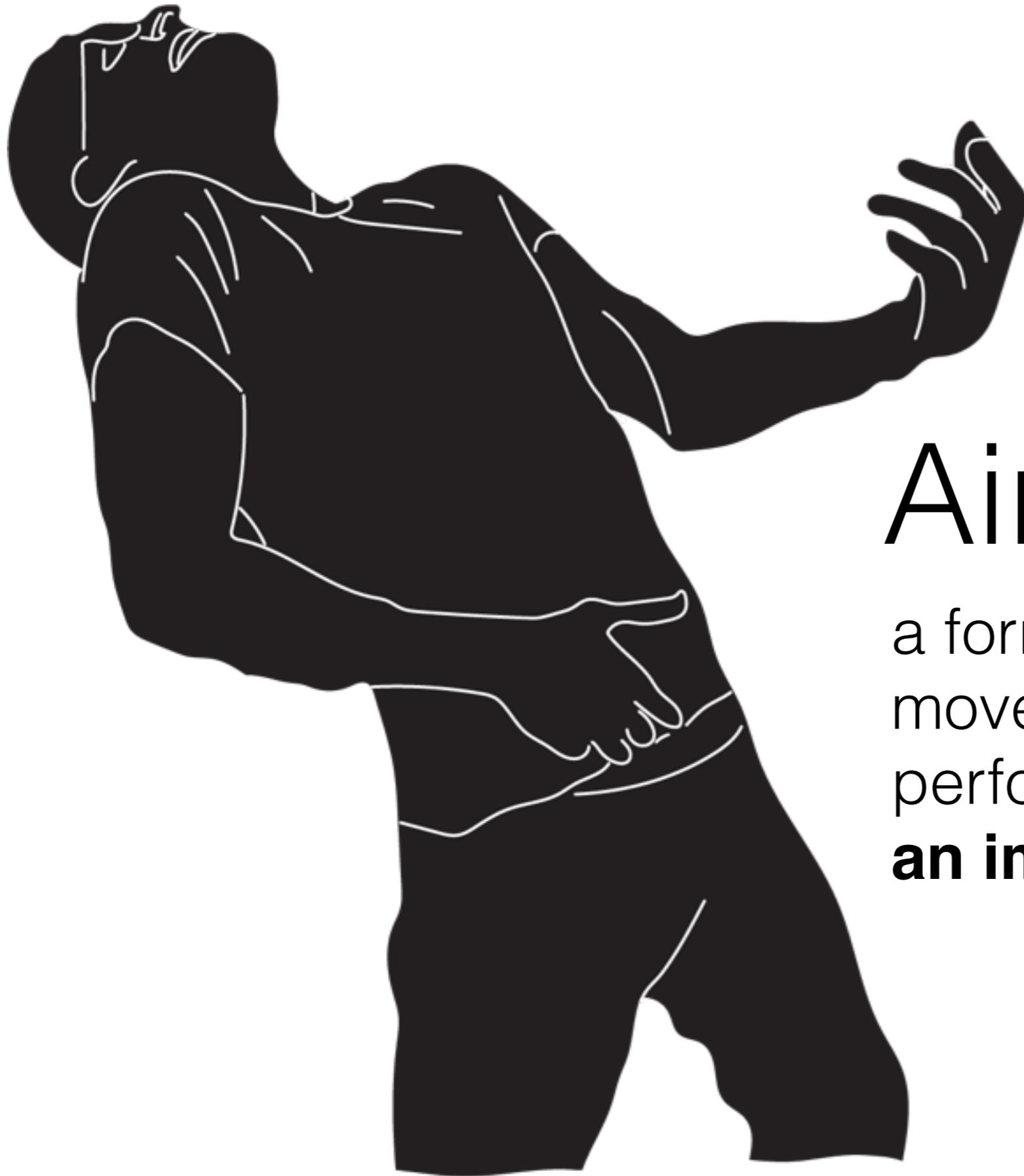
AUI 2016

Playing Air Guitar by Electrical Muscle Stimulation

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National
Taiwan
University



Air Guitar

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

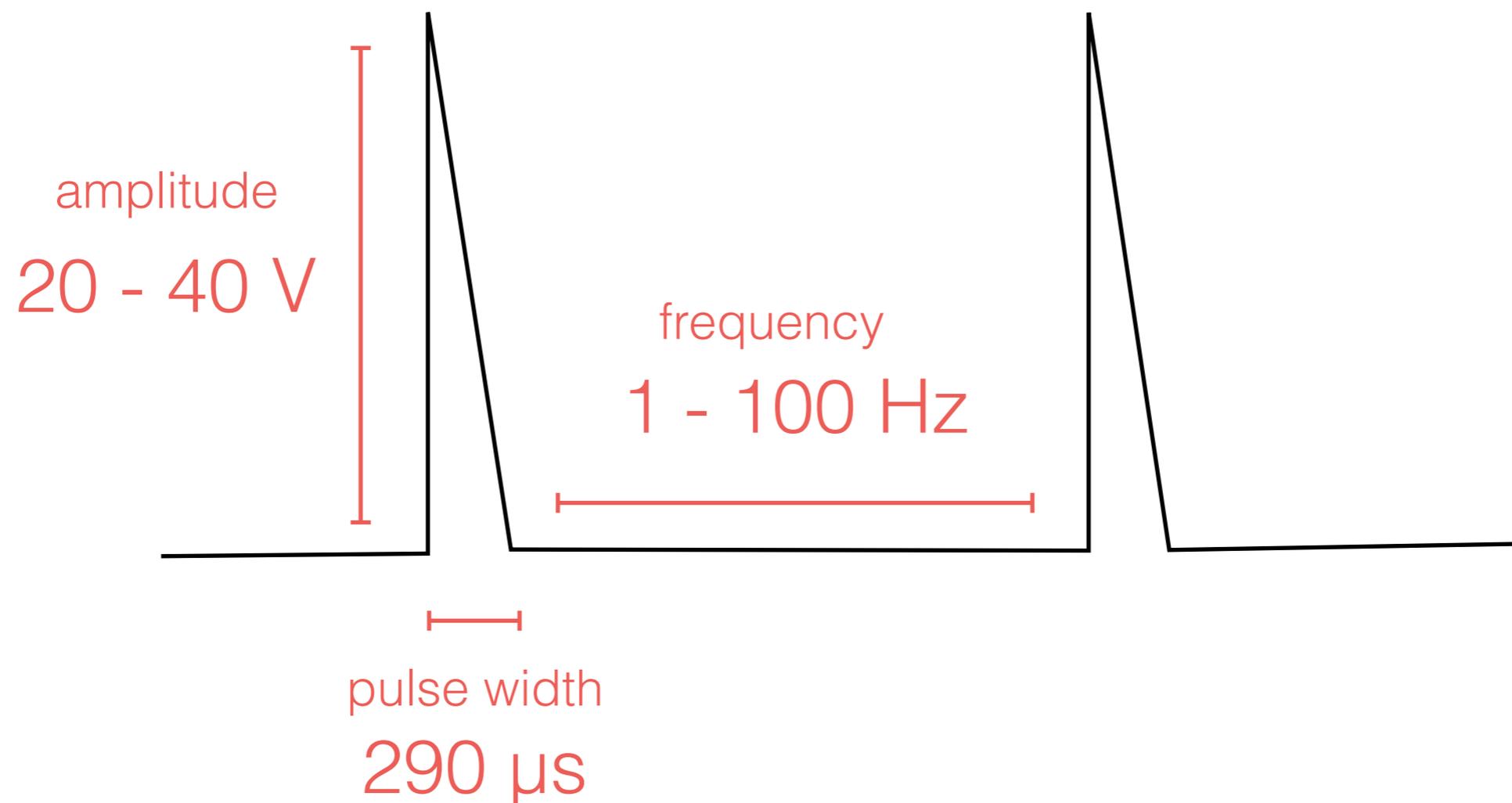


- body coordination
- sense of groove
- imaginations

**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

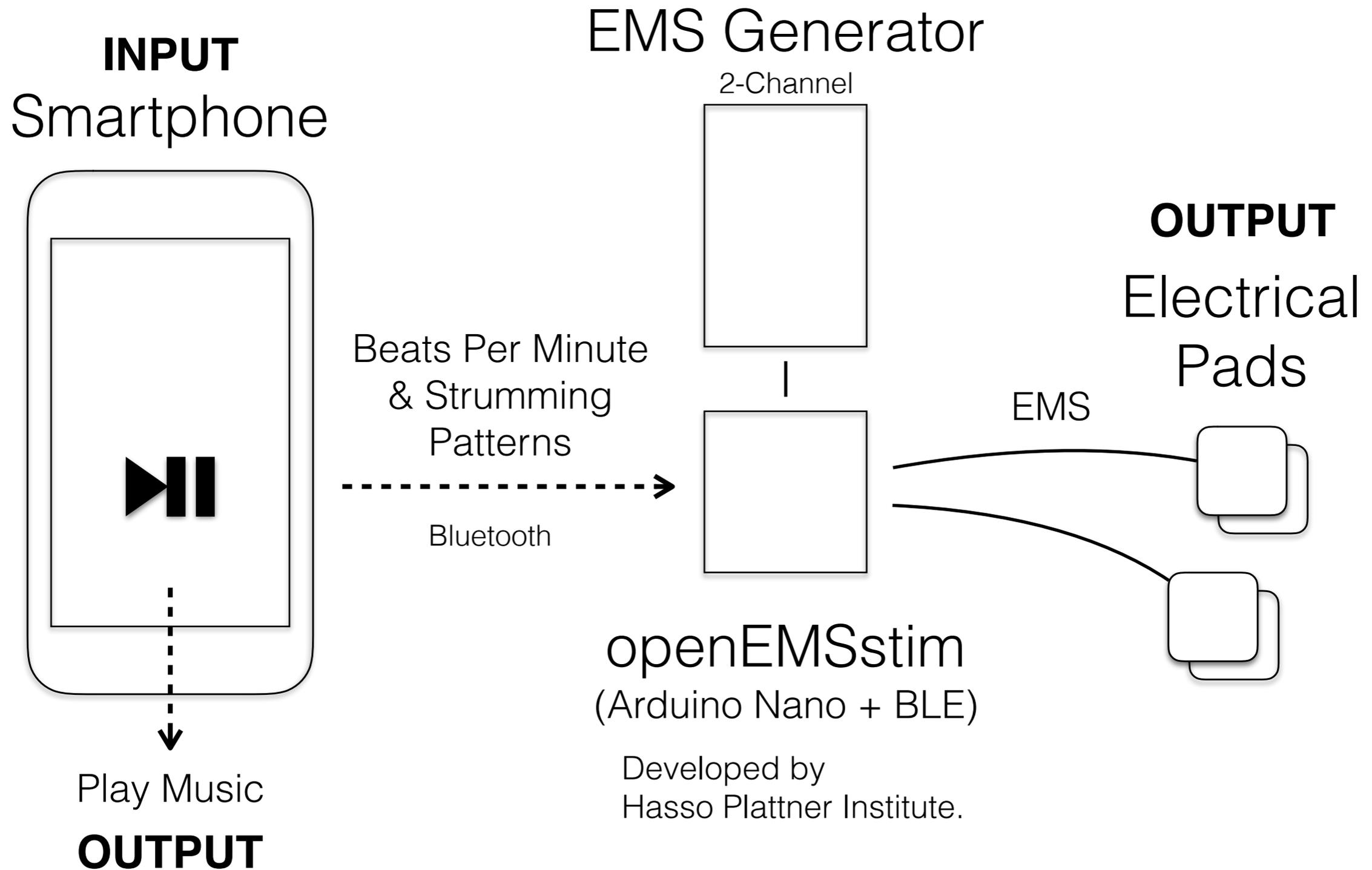
Emi Tamaki, Takashi Miyaki,
and Jun Rekimoto.

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



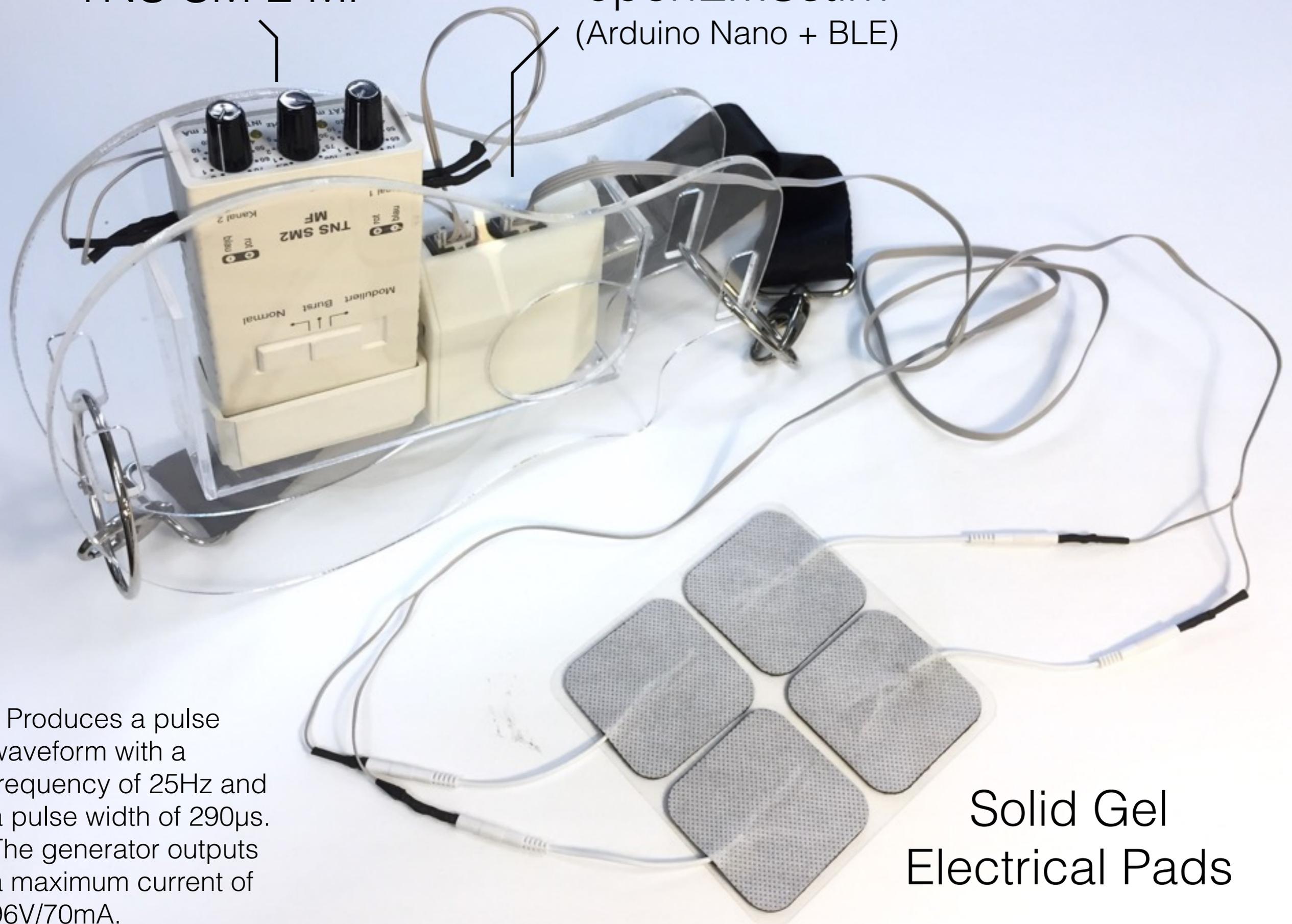


Implementation (Wireless Version)



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

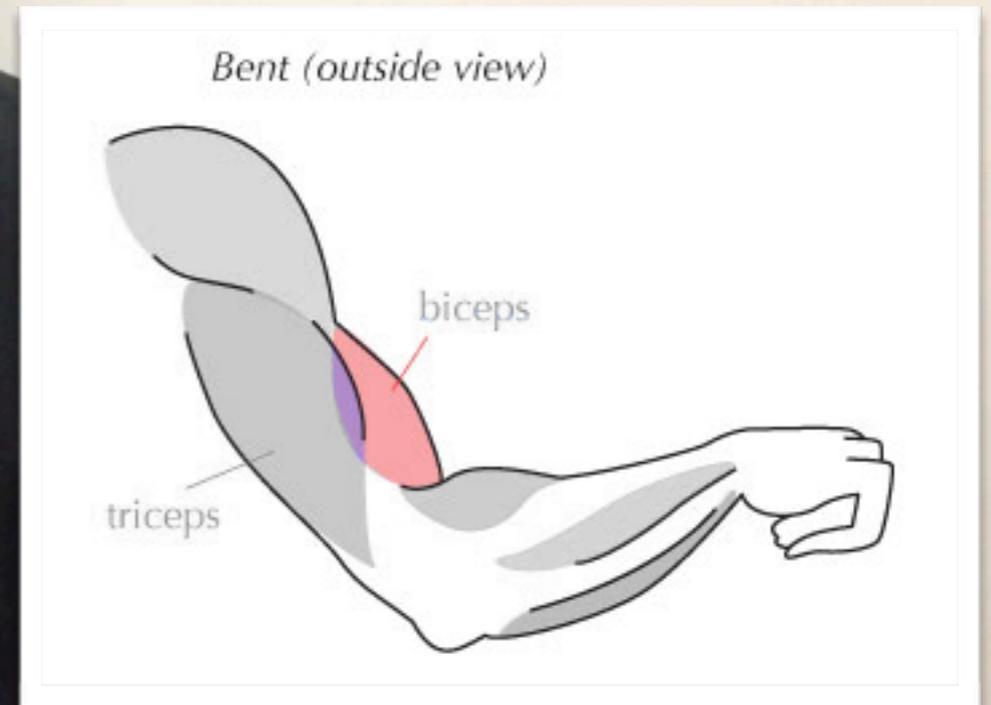
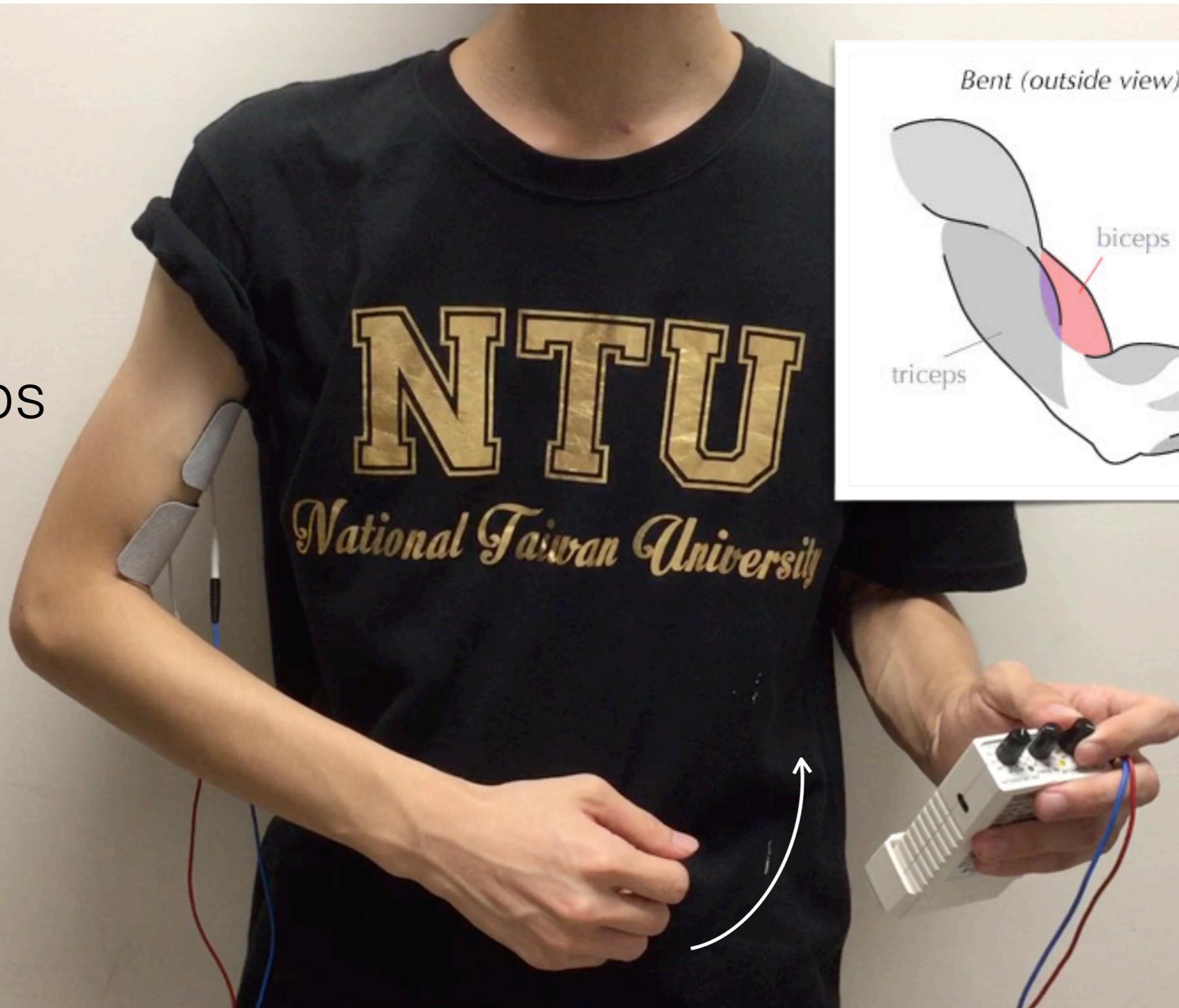


Android App

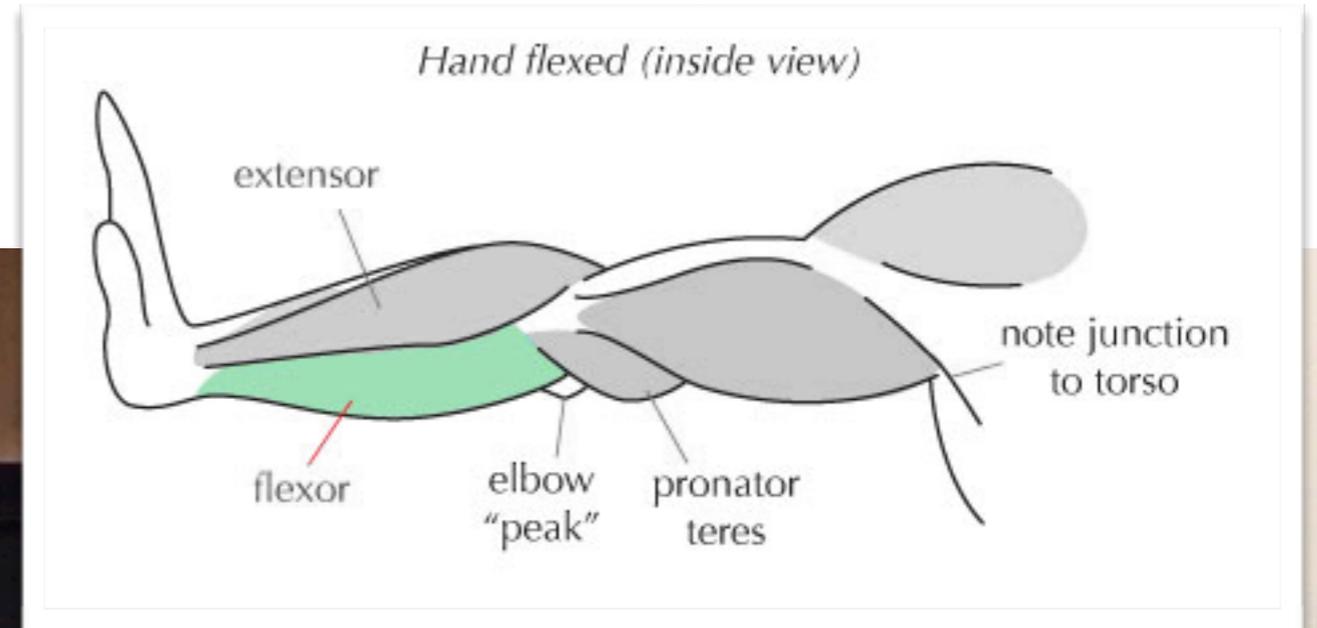
Play music
Sync movements

Heavy strumming

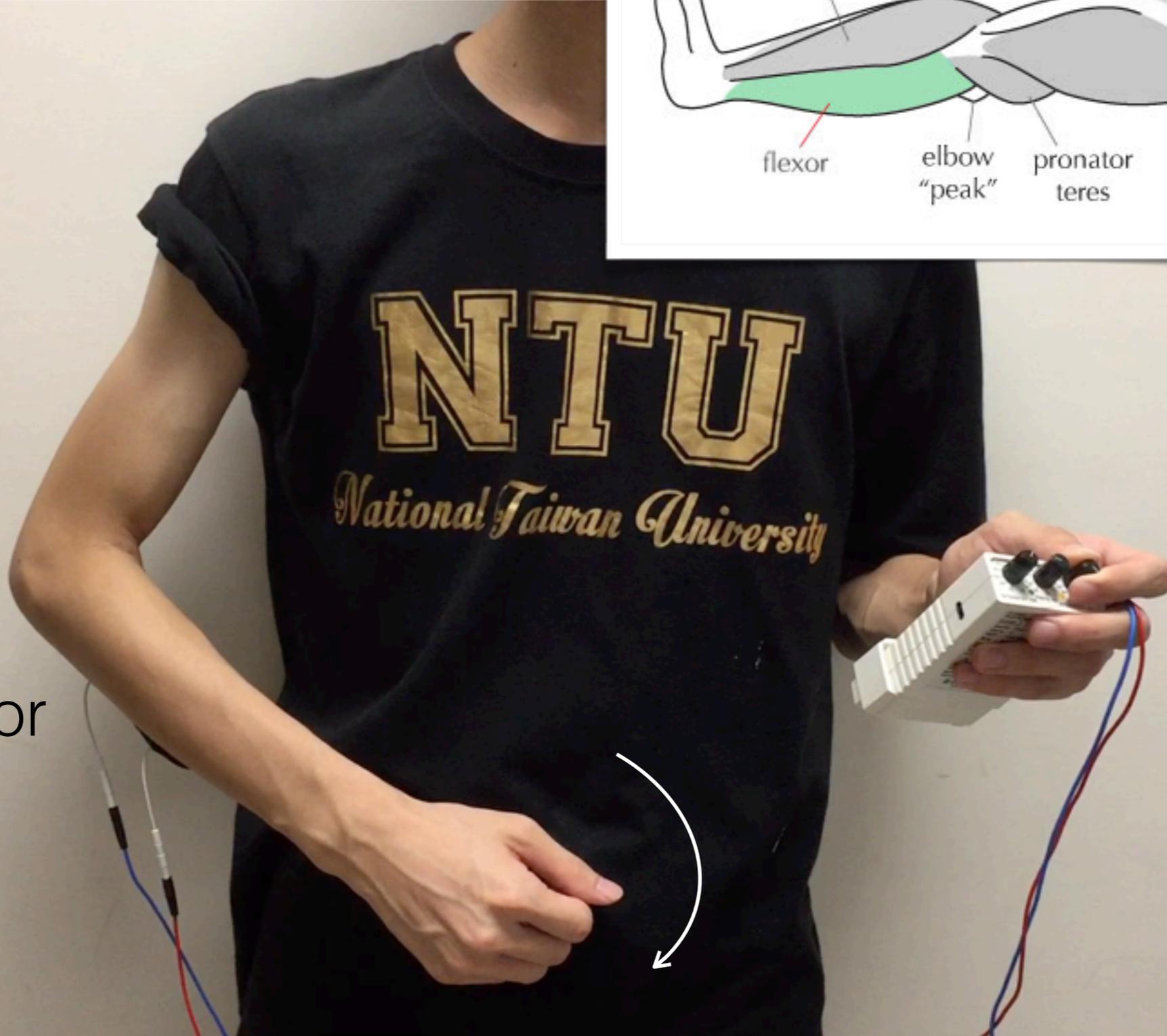
biceps



Light strumming



flexor



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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