

## Multimedia Improvisation for brain waves, cello and live electronics

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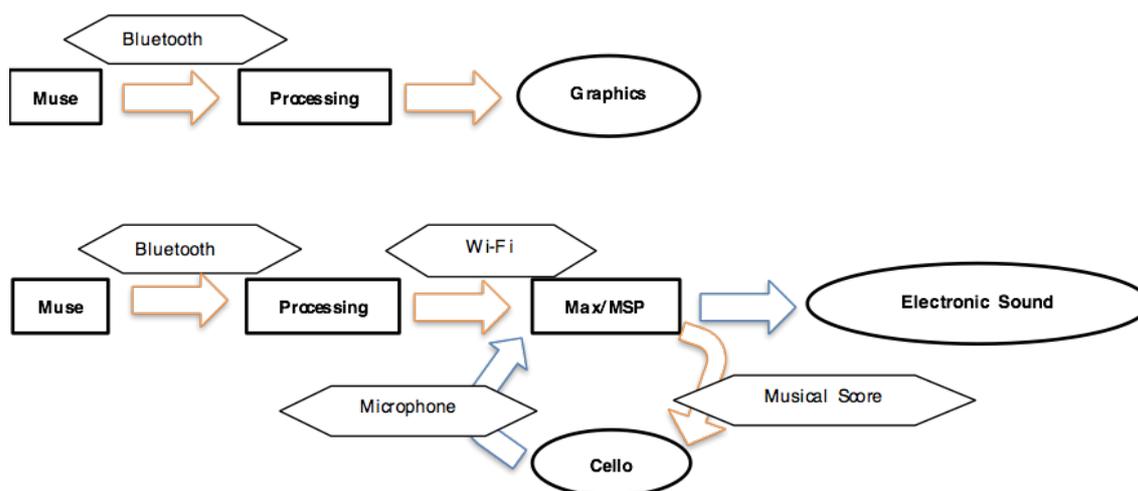
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We have been developing brain-waves music systems using MUSE which equips a headset with 5 sensors. In the performance we will demonstrate our systems as an audio-visual output, applying Processing that allows for the reception and visualisation of signals of brain-waves from MUSE. Max/MSP and its plugin, *bach* are also applied to produce real-time scores based on brain-wave signals for a cellist, and Max/MSP is used for live-electronic sound components. One performer's brain waves are used for the source of image processing, and the other performer's are used for the source of score creation.



### REFERENCES

M. Yokoyama, Y. Kubota, K. Kikuchi, G. Yagawa, and O. Mochizuki, "Some remarks on surface conditions of solid body plunging into water with particle method" *Advanced Modelling and Simulation in Engineering Sciences*, Vol. 1(1), pp.1-14 (2014).

**Masao Yokoyama** (b.1973, Hiroshima) started violin when he was 4 years old, and also started cello when he was 10 years old. He completed a Master's degree in Information Science at Waseda University in 1997. After working as an instructor of cello at the Popular Music school of YAMAHA Co., he started arrangement and composition of chamber music in his own concerts and live performances. In 2009, he received a doctorate in Engineering at Toyo University, and he has been an Associate Professor at Meisei University (Faculty of Information Science, Tokyo) since 2012. He has also been engaging with the study of composition with electronic and acoustic materials, and he

studied composition under Prof. T. Hisatome. Some chamber music scores, composed by Yokoyama have been published as follows:

“Selection of Astor Piazzolla for piano trio” (Hotta Pub. Co. Ltd, 2016)

“String Quartets of Popular & Classic Music for concert and party” (Yamaha Music Media, Co. Ltd, 2014)

“Rhapsody on a Thema of KUSATSU-BUSHI for String Orchestra and Percussion” (Hotta Pub. Co. Ltd, 2014)

“Furusato” for string orchestra (Japanese traditional song, arrangement, Hotta Pub. Co. Ltd, 2014)

**Fumiya Takahashi** (b. 1994, Tokyo) has been studying at the department of Information Science, Meisei University under Prof. Masao Yokoyama. He is interested about what kind of influence music will have over human beings. Currently he has been researching the relation between brain waves and music, applying visualisation technology to brain waves and observing effects of music.

**Toru Sato** (b. 1995, Saitama) has been studying at the department of Information Science, Meisei University. His current research interest includes relation between brain waves and music, and he is studying under Prof. Masao Yokoyama.

**Haruka Hirayama** is a composer and performer, who comes from Niigata. She studied composition and computer music at Kunitachi College of Music, and she completed her undergraduate and Master's degrees there. Recently she was also awarded a Ph.D in Music (Electroacoustic Composition) from Manchester University, and is a researcher at Tokyo Denki University.

She mainly composes interactive computer music, focusing on instruments and live electronics, and her works have been awarded the Residence Prize at the 32nd International Competition of Electroacoustic Music and Sonic Art (IMEB/Bourges, France) in 2005, and the Pauline Oliveros Prize at the Search for New Music by Women Composers Competition (IAWM/US) in 2012. Many works have been performed at international festivals as well as conferences worldwide.

As a researcher she has been developing interactive systems for music production, exploring alternative methods for creating interactive pieces as well as performing manners of interactive works. She has recently committed to collaboration projects such as: Brainwaves and Music, led by Prof. Yokoyama of Meisei University, and Synesthesia Virtual Reality: Rez Synesthesia Suit, led by the project team of Keio Media Design.

