

## Academic CV, 2019

### Personal information:

Full name: Ole Adrian Heggli  
Day of Birth: 11<sup>th</sup> March 1989  
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Nationality: Norwegian



My research currently focuses on exploring the cognitive mechanisms that facilitates interpersonal coordination. I approach this field with the use of novel techniques such as multiperson-EEG, mass motion tracking, and computational modelling. As part of this work I implement knowledge and expertise from my background in acoustics and music technology towards creating software, hardware and apps that facilitate data collection and analysis.

### Publications:

Heggli, O. A., Kringelbach, M. L., Vuust, P. (2018). Please Please Me! The pleasure of music in the brain. In Gouk, P. et. al. (Eds.) *The Routledge Companion to Music, Mind and Wellbeing*, Routledge (in press).

Jensen, M. S., Heggli, O. A., da Mota, P. A., & Vuust, P. (2017). A low-cost MRI compatible keyboard. In *The International Conference of New Interfaces for Musical Expression 2017* (pp. 257-260).

Heggli, O. A., Konvalinka, I., Brattico, E., Vuust, P. (2017). Effects of a non-shared predictive model in joint tapping - a dual-EEG study. Poster, Neuroscience and Music IV, Boston, 2017.

### Current and recent projects:

- Dual-EEG joint action experiment
  - This study is the primary experiment in my Ph.D. and explores the role of predictive processes on dyadic interaction, by using a finger tapping paradigm. Dual-EEG allows us to quantify and identify brain activity related to interpersonal coordination. Custom software and microcontrollers are used to enhance data quality.
- Computational modelling of interpersonal synchronization
  - This project, in collaboration with the Hedonia Research Group, Oxford University, uses coupled Kuramoto oscillators to model and predict human behaviour.
- Mass-experiment, SPOT festival 2017
  - This experiment explored the link between rhythmic complexity and dance movement. In addition to publishing an app on Google Play and the App Store, this study entailed motion tracking of ~80 participants.

- MRI-compatible keyboard
  - Here we designed and built a fiber-optic MRI-compatible keyboard to facilitate research on musical performance.
- Custom online survey on musical groove
  - A survey webpage using HTML5, JavaScript and a MySQL-database were designed, and used to collect >200 responses.
- Psychoacoustical test battery
  - A battery of interactive psychoacoustical tests were implemented in MATLAB, and is used as part of the SkuldNet neuroscience consortium's ongoing data collection.
- Max/MSP and PsychoPy scripts for neuroimaging and behavioural research
  - I have created various Max/MSP and PsychoPy scripts designed for paradigms currently in use in behavioural, EEG and fMRI experiments, with both serial and parallel port interfaces. Currently running experiments include rhythmical discrimination tasks, augmented guitar learning studies, and fMRI-studies on vocal performance.

## **Education:**

### **Ph.D. Department of Clinical Medicine, Aarhus University**

Center for Music in the Brain, Aarhus University and the Royal Academy of Music, Aarhus/Aalborg

**Ph.D. Dissertation**, "Strategies for interpersonal synchronization in musicians: Behaviour, modelling, and neuroimaging"

### **Sonic Arts Master program, 2011-2012**

Sonic Arts Research Centre, Queen's University Belfast

Modules: Sound, Signals and Senses, Sonic Arts, Interaction Design and Spatial Audio.

**Master's Dissertation**, "Good Vibrations - Enabling instrument recognition with psychoacoustically synthesized haptic feedback"

Grade: Pass with Distinction (first)

### **High Intensity Course in Math and Physics, 2011**

Sør-Trøndelag University College

Modules: Math and Physics, comparable to 1<sup>st</sup> year engineering math in the US education system.

Grade: Pass

### **Bachelor of Arts, 2008-2011**

**Norwegian University of Science and Technology**

Major/Minor: Musicology/Music Technology

Overall Grade: B

## Occupation:

**oHap**, Manager and researcher, Oslo, Norway (January 2013-present)

- Researching high-definition haptics on grant from Innovation Norway.

**Center for Music in the Brain, Aarhus University and the Royal Academy of Music, Aarhus/Aalborg**, PhD Fellow, Aarhus, Denmark (December 2015-March 2019)

- My PhD project explores, amongst other things, how interpersonal coordination occurs on a millisecond scale.
- Methods: Multiperson-EEG, mass motion tracking, behavioural paradigms, computational modelling.

**Center for Music in the Brain, Aarhus University and the Royal Academy of Music, Aarhus/Aalborg**, Research Assistant, Aarhus, Denmark (September 2015-December 2015)

- Preparing PhD studies under supervision of Professor Peter Vuust, Professor Elvira Brattico and Professor Morten Kringelbach.

**Westerdals Oslo School of Arts, Communication and Technology** (Formerly known as Nordic Institute of Stage and Studio, NISS), Oslo, Norway (August 2013-August 2015)

- Assistant professor at the Faculty of Performing Arts, lecturing in Psychoacoustics, Electroacoustics, Room Acoustics, Sound perception, System Design, and Programming.

**Rockheim, National Museum of Pop and Rock**, Trondheim, S-T (February 2011-August 2013)

- Technical supervisor and guide. Experienced in troubleshooting and daily operation of a 90+ computer server park running a highly interactive exhibition.

**Gluntan**, hired freelance musician, Trondheim, S-T (November 2008-August 2010)

- One of the most performing bands in Norway, 85+ gigs in 2009. Experienced in high-stress performances, for instance performing live on radio for 500.000+ listeners.

## Skills and technologies:

- Expert in haptic feedback.
- Programming languages: MATLAB, R, Python/Psychopy, Java for Android, HTML5, JavaScript, Immersions TouchSense UHL, Max/MSP, CATT-acoustic, and more.
- Operating systems: Windows XP/7/10, various Linux distros, Max OS
- Experienced in using MATLAB distributed computing server.
- Arduino and derivatives, in particular Teensyduino and its audio shield.
- Design, collection, and analysis of quantitative and qualitative empirical experiments.
- Advanced computational statistics.

### Teaching and supervision:

- Supervision of master and research year students, Frank Schulze, Steen Lavigna-Pedersen, and Lena Molin.
- Lectures at the course Experimental Musicology, 2017, Aarhus University.
- Various courses in Room Acoustics, Psychoacoustics, Electroacoustics, System design, Programming and Music analysis at Westerdals Oslo ACT (formerly NISS)
- Introduction to compositional history and strategies for fellow students, SARC, Belfast, 2012.
- Introduction to MATLAB for fellow students, SARC, Belfast, 2011

### Languages:

- 677 (top grade) points on the written Test of English as a Foreign Language (TOEFL), 2010
- Native level English
- Native level Norwegian
- Written and spoken comprehension of Swedish
- Written and spoken comprehension of Danish

### Achievements and Awards:

- Awarded fully funded PhD position at Center for Music in the Brain
- Awarded research grant from Innovation Norway, 2014.
- Accepted to Berklee College of Music in 2009, but could not attend because of economical reasons.
- Accepted to the 3rd round of auditions at the highly prestigious Norwegian Academy of Music, 2010.
- Spring 2010 I took 150% the normal workload at University, fall 2010 I increased to 175%.
- Queen's University Postgraduate International Students Award, September 2011.

### Selected performance history:

#### 2014

- Headlining Strandafestivalen with TEMPO, Norway.
- Various concerts with Tempo, Norway.

#### 2013

- Performed for H.M. Harald V. of Norway, H.M. Sonja of Norway and Minister of Culture Hadia Tajik during their 2013 tour of county Sør-Trøndelag, Norway.
- Easter tour with TEMPO, Norway.
- Trondheim Calling with TEMPO, Norway.

#### 2012

- Christmas Tour with TEMPO, Norway.

- Integrated patch performance with Anna Weisling, *On the Edge of and Trap*. ISMIR, the International Society for Music Information Retrieval Conference. October, Porto, Portugal. (Cancelled)
- *On the Edge of and Trap*, ISCRiM Student Conference on Music, Multimedia and Electronics. June, Leeds, UK.

## 2011

- Exam accompanist, Musicology students. Department of Musicology, NTNU, Trondheim, Norway.
- Freelance keyboardist, with Bispehaugen Brass Orchestra. National Championship in Brass Orchestra performance, Lillesalen, Olavskvartalet, Trondheim, Norway.

## References:

(More references and letters of recommendation can be provided upon request)

### **Professor Peter Vuust**

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### **Professor Tore Teigland**

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