

# Alex Brandmeyer

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## CONTACT INFORMATION

Max Planck Institute for Cognitive and Brain Sciences  
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Germany

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## RESEARCH INTERESTS

cognitive neuroscience, auditory perception, music cognition, psycholinguistics, neuroimaging, machine learning, computational modeling, music and audio technology

## EDUCATION

**Radboud Universiteit Nijmegen**, Nijmegen, the Netherlands

Ph.D., Department of Artificial Intelligence, March 2014

- Dissertation Title: “Auditory perceptual learning via decoded EEG neurofeedback: a novel paradigm”
- Advisors: Peter Desain, James M. McQueen

M.Sc., Cognitive Psychology (Cum Laude), November, 2006

- Thesis Topic: “Real-time visual feedback in music pedagogy: Do different visual representations have different effects on learning?”
- Advisor: Peter Desain

**University of California**, Berkeley, California, USA

B.A., Cognitive Science, December, 2000

B.A., English Literature (Cum Laude), December, 2000

B.A., Philosophy, December, 2000

## TEACHING QUALIFICATIONS

**University Teaching Qualification** (Basiskwalificatie Onderwijs/BKO)

**April 2013**

## ACADEMIC EXPERIENCE

**Max Planck Institute for Cognitive and Brain Sciences**, Leipzig, Germany

*Postdoctoral Fellow*

**January 2014 - present**

**Donders Institute for Brain, Cognition, and Behaviour**, Nijmegen, the Netherlands

*Research Scientist*

**April 2009 - December 2013**

Conducted behavioral and electroencephalographic (EEG) research on speech and music perception. Presented work at international scientific conferences and published research results in various peer-reviewed journals. Collaborated on the development of research projects with fellow scientists at RU Nijmegen and Kumamoto University, Japan. Developed experimental and data analysis frameworks for use by collaborators in the EarOpener project on auditory BCIs and EEG-based neurofeedback for perceptual learning in the domains of speech and music. Served as PhD student representative within the Donders Institute and within the PhD Student Council at the Radboud University, and organized institute-wide events. Educational tasks within the Cognitive Artificial Intelligence department of the Faculty of Social Science included supervision of bachelor’s and master’s student internship projects and teaching of the Research Methods (4 years), Trends in Artificial Intelligence (2 years), and Brain-Computer Interfacing courses (2 years).

*Research Technician*

**August 2005 - April 2009**

Provided technical and programming services for the Music Mind Machine (MMM) group, within

the context of the PracticeSpace and the BrainGain projects. Designed and programmed the PracticeSpace system for running experiments using real-time visual feedback for expressive percussion and piano performances. Developed and implemented technical facilities for running experiments using high-density EEG recordings and online signal classification applications for the purposes of developing EEG-based brain computer interfaces. Developed and maintained group computation and file servers, network services, recording studio and lab facilities. Developed studies using real-time visual feedback on expressive percussion performances. Assisted in the development of long-term project research goals and planning. Co-taught Music Cognition class (3 years)

**VA Speech and Hearing Research Program, Martinez, California, USA**

*Research Assistant/Technician*

**May 2001 - May 2004**

Conducted research and experiments on speech perception in noise and the cocktail-party effect. Designed experiments and synthesized experimental materials. Ran participants on experiments and audiometric tests. Developed a paired database and psychoacoustics testing application to run experiments and collect data. Maintained and developed the research group's technical facilities, including computer systems, servers, research hardware and other equipment. Assisted in the writing of scientific papers and the organization of a workshop on speech perception in noise.

**Center for New Music and Technology, Berkeley, California, USA**

*Student Assistant*

**September 2000 - December 2000**

Master and archive a library of digitally recorded performances at CNMAT. Assist in the setup of a multi-channel audio and Max/MSP setup for a series of performances of compositions by CNMAT composer Ron Smith.

**PUBLICATIONS**

Alex Brandmeyer, Makiko Sadakata, Loukianos Spyrou, James M McQueen and Peter Desain. (in preparation). Modulation of auditory evoked responses using online decoded-EEG neurofeedback: Towards enhanced perceptual learning.

Makiko Sadakata, Mizuki Shingai, Alex Brandmeyer & Kaoru Sekiyama. (submitted). Sound of silence - Empirical evidence of moraic representations of geminate consonants by Japanese native listeners.

Alex Brandmeyer, Makiko Sadakata, Loukianos Spyrou, James M McQueen and Peter Desain. (2013). Decoding of single-trial auditory mismatch responses for online perceptual monitoring and neurofeedback. *Frontiers in Neuroscience*. 7(265), 1-21.

Alex Brandmeyer, Jason Farquhar, James M McQueen & Peter Desain. (2013). Decoding speech perception by native and non-native speakers using single-trial electrophysiological data. *PLOS ONE*. 8(7), e68261.

Alex Brandmeyer, Peter Desain & James McQueen. (2012). Effects of native language on perceptual sensitivity to phonetic cues. *NeuroReport*. 23(11), 653-657.

Alex Brandmeyer, Renee Timmers, Makiko Sadakata & Peter Desain. (2011). Learning expressive percussion performance under different visual feedback conditions. *Psychological Research*. 75(2), 107-121.

Makiko Sadakata, David Hoppe, Alex Brandmeyer, Renee Timmers & Peter Desain. (2008). Real-Time Visual Feedback for Learning to Perform Short Rhythms with Expressive Variations in Timing and Loudness, *Journal of New Music Research*. 37(3), 207-220.

CONFERENCE  
POSTERS AND  
PRESENTATIONS

Pierre Divenyi & Alex Brandmeyer (2005). The role of stress-accent in the understanding of sentences in noise. *Journal of the Acoustical Society of America*. 117(4):2623.

Tijl Grootswagers, Karen Dijkstra, Louis ten Bosch, Alex Brandmeyer and Makiko Sadakata. Word identification using phonetic features: towards a method to support multivariate fMRI speech decoding. 14th Annual Conference of the International Speech Communication Association, Lyon, France.

Alex Brandmeyer, Makiko Sadakata, Loukianos Spyrou, James M. McQueen and Peter Desain. Perceptual learning via decoded-EEG neurofeedback. 5th International Brain-Computer Interface Meeting, Pacific Grove, California, USA.

Alex Brandmeyer, Makiko Sadakata, Loukianos Spyrou, James M. McQueen and Peter Desain. Effects of decoded-EEG neurofeedback on auditory perceptual learning. Cognitive Neuroscience Society Meeting 2013, San Francisco, California, USA.

Christian Hoffmann, Alex Brandmeyer, Makiko Sadakata, Loukianos Spyrou, Jason Farquhar, James M. McQueen & Peter Desain. EarOpener: classification of auditory stimuli of varying complexity. Berlin Brain-Computer Interfacing Workshop 2012, Berlin, Germany.

Makiko Sadakata, Mizuki Shingai, Alex Brandmeyer and Kaoru Sekiyama. Perception of the moraic obstruent /Q/: a cross-linguistic study. 13th Annual Conference of the International Speech Communication Association, Portland, Oregon, USA.

Alex Brandmeyer, James McQueen and Peter Desain. Single-trial classification of MMN responses to speech stimuli in native and non-native listeners. Proceedings of the 6th Conference on Mismatch Negativity (MMN) and its Clinical and Scientific Applications, New York City, USA.

Makiko Sadakata, Alex Brandmeyer, Loukianos Spyrou, Peter Desain and James M. McQueen. A cross-linguistic study on perception of the Japanese geminate-singleton fricative contrast. Proceedings of the 6th Conference on Mismatch Negativity (MMN) and its Clinical and Scientific Applications, New York City, USA.

Alex Brandmeyer, James McQueen and Peter Desain. Tracking individual electrophysiological responses of English and Dutch listeners to English stop consonants. Federation of European Neurosciences Forum 2010, Amsterdam, the Netherlands.

Alex Brandmeyer, Peter Desain, and James McQueen. Effects of native language on phonetic processing in Dutch and American listeners. Proceedings of the 5th Conference on Mismatch Negativity (MMN) and its Clinical and Scientific Applications (MMN09), Budapest, Hungary.

Makiko Sadakata, Alex Brandmeyer, Renee Timmers, Akvile Miezlaiskyte and Peter Desain. A Longitudinal study of rhythm tapping with visual feedback. Proceedings of the 10th International Conference on Music Perception and Cognition (ICMPC10), Sapporo, Japan.

Makiko Sadakata, Alex Brandmeyer, Renee Timmers and Peter Desain. A visual feedback system with interactive contrast training for fluent finger piano exercises. Proceedings of the 10th International Conference on Music Perception and Cognition (ICMPC10), Sapporo, Japan.

Renee Timmers, Alex Brandmeyer, and Peter Desain. Improving rhythmic performance with the aid of visual feedback. Proceedings of the XVth meeting of ESCOP. 82.

Renee Timmers, Alex Brandmeyer, and Peter Desain. Probabilistic classification of the style of drum performances. Proceedings of the 8th Conference of the Society for Music Perception and

Cognition, 2007. 38-39.

Alex Brandmeyer, Renee Timmers and Peter Desain. Real-time visual feedback in music pedagogy: Do different visual representations have different effects on learning? Proceedings of the 8th Conference of the Society for Music Perception and Cognition, 2007. 89.

Alex Brandmeyer, Renee Timmers, Peter Desain. Does real-time visual feedback improve expressive percussion performance? Rhythm Production and Perception Workshop 2007, Dublin, Ireland.

Makiko Sadakata, Alex Brandmeyer, David Hoppe, Renee Timmers & Peter Desain. Learning to perform short musical rhythms with expressions. Rhythm Production and Perception Workshop 2007, Dublin, Ireland.

Alex Brandmeyer, David Hoppe, Renee Timmers, Makiko Sadakata, and Peter Desain. PracticeSpace: A platform for real-time visual feedback in music instruction. Proceedings of 9th International Conference on Music Perception and Cognition (ICMPC9), Bologna, Italy.

David Hoppe, Alex Brandmeyer, Renee Timmers, Makiko Sadakata, and Peter Desain. The effect of real-time visual feedback on the training of expressive performance skills. Proceedings of 9th International Conference on Music Perception and Cognition (ICMPC9), Bologna, Italy.

Alex Brandmeyer. "Visual feedback in learning to perform music." Presented for the Summer School in Sound and Music Computing 2006.

Pierre Divenyi, Brian Gygi, and Alex Brandmeyer. Dissection of the cocktail-party Effect: Informational masking of a speech-analog target by a simultaneous speech-analog distractor. Presented at the Association for Research in Otolaryngology 2004 Mid-Winter Meeting.

Pierre L. Divenyi, Alex Brandmeyer. The cocktail-party effect and prosodic rhythm: Discrimination of the temporal structure of speech-like sequences in temporal interference. Presented at the 15th International Conference on Phonetic Sciences.

Pierre L. Divenyi, Alex Brandmeyer. Selective attention to a given stream affects the segregation of simultaneous speech-analog streams. Presented at the Association for Research in Otolaryngology 2002 Mid-Winter Meeting.

#### INVITED TALKS

"Auditory perceptual learning via decoded-EEG neurofeedback: working towards a novel paradigm".

- Presented for the Max Planck Institute for Cognitive and Brain Sciences, August 2013, Leipzig, Germany
- Presented for the Departments of Psychology and Linguistics, University of Massachusetts at Amherst, May 2013, Amherst, Massachusetts, USA.
- Presented at the Center for Computer Research in Music and Acoustics (CCRMA), Stanford University, April 2013, Palo Alto, California USA.
- Presented for the Helen Wills Neuroscience Institute, University of California at Berkeley, April 2013, Berkeley, California USA.
- Presented for the Swartz Center for Computational Neuroscience, University of California at San Diego, April 2013, La Jolla, California USA.

"Linear classification of EEG measurements during speech perception in native and non-native

speakers.” Presented at the Donders Discussions, October 2012, Nijmegen, the Netherlands.

“Music and the brain: a journey into the secret places of the soul.” Presented for the Orlando Festival, August 2012, Kerkrade, the Netherlands.

“Effects of native language on phonetic sensitivity.” Presented at Kumamoto University, June 2011, Kumamoto, Japan.

“Music Cognition: a general introduction to past and current research.” Presented for the Utrecht University Biology Student Union, February 2010, Utrecht, the Netherlands.

“Music Cognition: a general introduction to past and current research.” Presented for the Radboud University Psychology Student Union, January 2010, Nijmegen, the Netherlands.

PROFESSIONAL  
EXPERIENCE

**Santarella, LLC**, Tyringham, Massachusetts USA

*General Manager*

**May, 2004 - August, 2005**

Helped in the initial startup of a small family business, running and maintaining a historical property in the Berkshire region of Massachusetts. Developed advertising and marketing campaigns, handled relations with clients and suppliers, performed maintenance and repairs on the property, installed and developed network and multimedia facilities through multiple on-site buildings.

**Independent musician and performer**

Performed as a DJ and computer-based musician internationally alongside artists such as Dave Clarke, Darko Esser and Gonno. Organized, promoted, and performed on a weekly basis at well known clubs and bars in the San Francisco bay area. Produced and released music under the Zig Zag Sound moniker and as Alex Brandmeyer.

SOFTWARE  
DEVELOPMENT

**Cascade of Asymmetric Resonators with Fast-Acting Compression (CARFAC) Open-Source C++ Library, May 2013**

Implemented R. Lyon’s auditory image model in C++ for use as a front-end for real-time audio applications in the domain of machine perception. See: <https://github.com/google/carfac>

PROGRAMMING  
LANGUAGES

C++, Matlab, Max/MSP, Java, Shell scripting, XML/HTML, ActionScript

LANGUAGES

English (native), Dutch (NT2 diploma), Spanish, French (level 1 diploma)

WORK RIGHTS

USA, EU