

# Joseph German

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I am currently a PhD student in Brain and Cognitive Sciences at the University of Rochester. I graduated from the Peabody Institute of the Johns Hopkins University with Master of Music degrees in Musicology (focusing on music cognition) and Viola Performance. I also have a Bachelor of Music degree from the Peabody Institute of the Johns Hopkins University, with a minor concentration in courses in neuroscience and cognition from the Krieger School of Arts and Sciences of the Homewood campus. My research experience includes work on behavioral studies as a student research assistant in the Cognitive Neuroscience lab of Dr. Michael McCloskey and thesis work on computational modeling of object recognition, as well as research practicums in psychophysics and neuroimaging. Currently, I'm working with Dr. Robert Jacobs on creating a database of human similarity judgments of objects and creating machine learning algorithms to characterize these judgments.

## Education

- Current: PhD student in Brain and Cognitive Sciences at the University of Rochester in Rochester, NY.
- MM in Viola Performance and MM in Music Cognition from the Peabody Institute of the Johns Hopkins University  
**May 2016 /GPA: 3.99**
- Bachelor of Music, Viola Performance from the Peabody Institute of the Johns Hopkins University with a minor (courses concentrated in neuroscience/cognition) from the Krieger School of Arts and Sciences at the Johns Hopkins University  
**May 2013 / GPA: 3.94**
- Non degree student summer and fall of 2016 at the University of Maryland Baltimore County: math and programming classes /**GPA 4.0**
- Non degree student at Howard Community College taking programming classes, non credit

## Academic Honors

- NSF NRT Fellowship 2017-2018: National Science Foundation Data-Enabled Science and Engineering (NRT-DESE) award
- Appointed as a Visiting Scholar to the Department of Cognitive Science at Johns Hopkins University 2016-2017
- Mollie G. and Joseph L. Forscher Music Cognition Award (\$250), Peabody Conservatory 2016
- Delegate Terri Hill scholarship from the state of MD 2015-2016 \$1000
- Graduate Assistantship 2015-2016 – teaching assistant to Dr. Susan Weiss at Peabody and JHU
- Johns Hopkins Golden Key International Honor Society 2010-present
- Maryland Distinguished Scholar – received \$12,000 scholarship (SAT 2320 and co-valedictorian of HS class) 2009-2013
- Graduated Summa Cum Laude 2013
- Several full scholarships to summer music festival programs such as the Orchestra Institute Napa Valley, where I was selected as one of eight violists from worldwide auditions.

## Research and Lab Experience

- As a PhD student in the lab of Robert Jacobs at the University of Rochester, I am using Amazon Mechanical Turk to create a database of object similarity judgments. I am also working to create new algorithms for metric learning to characterize the cognitive processes behind the judgments in the database.
- Research Assistant in Dr. Michael McCloskey's lab in the JHU department of Cognitive Science 2015- 2017 (appointed as a visiting scholar for 2016-2017): I helped to investigate how people assign intrinsic axes to real-world objects with unusual geometries. My duties included running the experiment, analyzing the data, and helping to interpret the results. Participants were asked to replicate the orientation of briefly seen objects using discs with pictures of the objects on them; the errors our participants made implicitly told us about the axes they assigned to the objects.
- Graduate research (one year) towards the completion of my thesis: For my master's thesis, I developed a new neural network architecture for object recognition, called the "idealization network", which combines biological plausibility

with the capacity for unsupervised learning. My implementation using the R language is able to categorize MNIST digits after exposure to relatively few examples, without requiring any labels or a teacher. Future implementations with hierarchical feature recognition may even be capable of one-shot learning.

- Neuroimaging research: In 2015 I participated in a pilot study extending a 2014 study by Ferrara and Park, who examined scene-selective activation in the retrosplenial complex and parahippocampal place area to mats, curbs, and walls. My involvement in this study taught me about the principles of fMRI experiment design, operation, and safety.
- Psychoacoustics research: I had the leading role for a study examining the illusory continuity of tones, an auditory illusion where a non-continuous tone is perceived as continuous as long as the gaps are filled with noise of sufficient loudness. Working with other student researchers who specialized in audio engineering, I designed an experiment to determine the contribution of global information to the illusion.

## Publications

Chaisilprungraung, T., German, J., & McCloskey, M. (2016). *Principal axes of real-world objects: evidence from orientation reflection errors*.

## Master's Thesis

German, J. (2016). *The idealization network: a model of object recognition in vision and music*. (Unpublished master's thesis). Peabody Institute, Johns Hopkins University, Baltimore. Presented at the Second Annual Musicology Graduate Research Symposium.

## Teaching Experience

- Graduate Assistantship 2015-2016 – teaching assistant to Dr. Susan Weiss at Peabody and Johns Hopkins
- Private violin and viola teacher 2016-2017
- Teaching Assistant Fall 2018 BCS 260 Mind and Music (for Dr. David Temperley) at Rochester University

## Professional Associations

- American Federation of Musicians Local 40-543
- Cognitive Science Society

## Programming Languages and Software

- R
- Python
- C++,
- MATLAB
- HTML
- Javascript
- Stata
- Brainvoyager
- Photoshop

## Paid Work Experience

- Private violin/viola teacher 2016-2017
- Violist with the Occasional Symphony Orchestra 2012-2016
- Graduate Teaching Assistant to Dr. Susan Weiss 2015-2016

- Front desk and AV desk at the Peabody Institute's Friedheim Music Library

2012-2015

## **Volunteer Work**

- Creative Access performances (community outreach concerts at Hospice, nursing homes, etc.)
- Volunteer performer for Road Scholar music vacations for seniors
- Volunteer for the Music Cognition seminar and orientation week at the Peabody Institute
- Bird watcher and long time bird count volunteer for the Audubon Society

## **Musical Experience**

The various orchestras I have played in over the years have afforded me the opportunity to perform in venues such as Carnegie Hall, the Meyerhoff, Lisner Auditorium, and the Lyric Opera under conductors such as Marin Alsop, Leon Fleischer, and Martin West, among many others.

My extensive experience with 21<sup>st</sup> century music gives me a unique perspective on how the brain perceives music. Experimental pieces such as "Labyrinth" by David Dzubay and "As a Spell Against Falling Objects (or how I Learned to Love Gravity)" by Jeremy Podgursky focus on exploring mental states of mind.'

As a capstone of my musical experiences, in October 2015, as a member of the Peabody Symphony Orchestra, I worked with Maestro Marin Alsop, music director of the Baltimore Symphony Orchestra, to record a professional CD of Kevin Puts works for the Naxos label: [https://www.amazon.com/Kevin-Puts-Symphony-No-2/dp/B01GVYDWL2/ref=sr\\_1\\_2?ie=UTF8&qid=1471014398&sr=8-2&keywords=kevin+puts](https://www.amazon.com/Kevin-Puts-Symphony-No-2/dp/B01GVYDWL2/ref=sr_1_2?ie=UTF8&qid=1471014398&sr=8-2&keywords=kevin+puts)