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## Gabe Nespoli

Data Scientist | PhD Candidate

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## Summary

I am a PhD Candidate and aspiring Data Scientist with a passion for coding my way out of complex problems. My current work explores how brains represent music, and why tapping your foot can be irresistible. I am graduating in September and will be looking to start a career in data science.

*Skills:* data analysis, machine learning, signal processing, research design, EEG

*Tools:* MATLAB/Octave, Python, R, Linux, git, vim

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## Work Experience

### PhD Candidate

*2014-2018 | Ryerson University*

- Designs and programs experiments, collects and analyzes data, and effectively communicated results in papers, posters, and presentations
- Communicates technical ideas to non-technical audiences with ease
- Uses signal processing algorithms (filtering, independent components analysis, Fourier and wavelet transforms) for analyzing multi-channel biological data
- A/B testing for comparing different analysis pipelines
- Given multiple workshops on data analysis and programming

- Developed software for analysis of biological time-series data ([link](#))
- Developed an analysis framework for analyzing neural entrainment ([link](#))

## **MA Student**

*2012-2014 | Ryerson University*

- Developed scripts for extracting spectral features from EEG data (Fourier analysis, wavelet transformations)

## **Research Operations Coordinator**

*2010-2012 | Ryerson University*

- Collaborated with researchers on experimental design and analysis
- Offered training and support on research tools (hardware & software)
- Managed department resources and liaised with manufacturers
- Teaching assistant for a course on computational methods
- Managed the purchasing of research tools, including EEG, VR, and eye-tracking

## **Lab Manager**

*2007-2012 | Ryerson University*

- Managed, organized and executed daily lab activities
  - Ran participants in neural, physiological, and behavioural experiments
  - Recorded and edited audio/video stimuli (Avid Pro Tools, Adobe Premiere Pro)
  - Developed analysis tools and instructed others on their use (MATLAB, Microsoft Excel)
  - Responsible for payroll
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## **Education**

### **PhD in Psychology (Neuroscience)**

*2014-2018 | Ryerson University*

Neuroscience of music and movement:

When listening to music, neurons in the brain can synchronize their firing with the beat. This neural entrainment is how we are able to predict when the next beat will occur, and thus how we can tap our feet or dance along. The ability

of different music to compel movement in a listener varies, and this is likely also true of neural entrainment. This project investigates certain psychological, acoustic, and musical features of music—that have previously been found to create a desire to move—in their ability to entrain neurons in premotor areas of the brain. If a certain feature is good at entraining neurons that are related to planning movement, then it is likely that this is a feature that will create a desire to move in the listener.

Hearing aids and emotion:

Perceiving emotion in speech is a common shortcoming of modern day hearing aids, which can often lead to difficulties understanding others. This project uses physiological measures to see the effects of hearing aids on physiological responses to emotion. Specifically we investigated skin conductance levels (SCL; a “sweat” response that is a good indicator of general arousal) in hearing-impaired and -aided listeners when listening to happy, sad, angry, and calm speech.

### **Machine Learning Certificate**

*2017 | Stanford University via coursera.org*

Developed various algorithms from scratch including linear regression, logistic regression, regularization, anomaly detection, and neural networks.

### **MA in Psychology (Neuroscience)**

*2012-2014 | Ryerson University*

Thesis: Musicianship and neural synchronization at multiple timescales.

### **BSc in Psychology**

*2003-2007 | McGill University*

Thesis: Beauty in the body of the beholder: The physiological correlates of musical emotion.