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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

Work Experience

PhD Candidate

2014-2018 | Ryerson University

- Designs and programs experiments, collects and analyzes data, and effectively communicates results in papers, posters, and presentations
- Communicates technical ideas to non-technical audiences with ease
- Uses signal processing algorithms for analyzing multi-channel biological data (e.g., filtering, time-frequency transforms, independent components analysis)
- A/B testing to compare different analysis pipelines
- Gives workshops on data analysis and programming

- Develops software for analysis of biological time-series data (link)
- Develops an analysis framework for analyzing neural entrainment (link)

MA Student

2012-2014 | *Ryerson University*

- Designed and programmed EEG studies
- Developed scripts for extracting spectral features from EEG data, using both Fourier and wavelet methods

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 liased 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
- Heavily involved in the purchasing of equipment, setup, maintenance, and running of a recording studio in the lab
- Recorded and edited audio/video stimuli (Avid Pro Tools, Adobe Premiere Pro)
- Developed analysis tools and instructed others on their use (MATLAB, Microsoft Excel)
- Gained a reputation as the go-to person for tech and analysis

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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.