

# George Vengrovski

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## EDUCATION

Sep 2022  
to Present  
Eugene, OR

### University of Oregon

*PhD: Theoretical/Computational Neuroscience.*

- Advisor: Dr. Tim Gardner
- Dissertation Topic: Self Supervised Deep Learning Applied for Representation Learning of Birdsong
- GPA: 4.00/4.00
- Expected Graduation: Summer 2026.

Aug 2019 to  
May 2022  
Pullman, WA

### Washington State University

*B.S: Neuroscience, Magna Cum Laude*

- Advisor: Dr. Masha Gartstein
  - GPA: 3.78/4.00 (Dean's List all terms)
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## EXPERIENCE

Sep 2022  
to Present  
Eugene, OR

### PhD Candidate

*University of Oregon, Institute of Neuroscience, Gardner Lab*

- **TweetyBERT:** Developed a self-supervised image BERT model for representation learning of canary song. Enabled the analysis of spectral features of canary song and unsupervised clustering of song units.
- **Lightweight Song Detector:** Created a lightweight CNN +LSTM network that detects canary songs in real-time, ~100x cheaper than prior solutions. deployable onsite or via aws lambda.
- **Decoder Network:** Designed an embedding decoder for unsupervised annotation and segmentation of canary song, enabling large-scale neural lesion and doi experiments.
- **(Rotations)** Jaramillo and Murray Labs: Modified/printed neuropixel implant parts, assisted with surgeries, analyzed chronic recording data, implemented spiking neural models of songbird circuit.
- **(Teaching):** Modeling physiological systems, intro python, neurobiology, and psychology of happiness.

Apr 2022  
to Sep 2022  
Seattle, WA

### Junior Full Stack Software Engineer

*PNW Software Solutions*

- Co-designed integrated inventory management software for a home services firm.
- Built a scalable cloud-based file storage system (aws s3).
- Implemented authentication mechanisms, front-end state management.

Nov 2019  
to May 2022  
Pullman, WA

### Research and Teaching Assistant

*Washington State University*

- (Research): Developed a pipeline in MATLAB for the movement, cleaning, and analysis of data; conducted human EEG experiments on infants.
  - (Teaching): Bioinformatics lab section; tutored D1 athletes in general introductory courses (bio, cs, econ, english, math).
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## PREPRINTS, POSTERS, AND TALKS

- **Vengrovski G**, Hulsey-Vincent R, Bemrose M, Kapoor A, Gardner T. TweetyBERT: Self-Supervised Learning Reveals Structure in Complex Birdsong, *preprint in submission* (late January 2025).
  - **Vengrovski G**, Hulsey-Vincent R, Bemrose M, Gardner T. TweetyBERT: Unsupervised Representation Learning for Canary Song Segmentation and Clustering, *Oregon Biosciences Symposium 2024*, Portland, OR. (conference poster presentation).
  - Hulsey-Vincent R, **Vengrovski G**, Bemrose M, Kapoor A, Gardner T. Basal Ganglia Lesions Induce Stuttering in Canaries, *Neuroscience 2024*, Chicago, IL. (conference poster presentation).
  - **Vengrovski G**. Deciphering Canary Song: A Deep Dive into Self-Supervised Learning with TweetyBERT, *Animals in Translation: Imagining Criteria and Frameworks for Decoding Communication in Other Species Workshop*, Santa Fe Institute, Santa Fe, NM, April 29-30, 2024. (invited talk).
  - **Vengrovski G\***, Kapoor A\*, Gardner T. Unsupervised Syllable Identification Using Machine Learning, *BRAIN 2023*, Washington D.C. (conference poster presentation).
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## SKILLS

- **Spoken Languages:** English, Russian.
- **Technical Coursework:** Machine learning, Data Structures, Statistics, Linear Algebra, Calculus i–iii, Systems Neuroscience, Cellular Neuroscience, Genetics, Neuroanatomy, Physics, Organic Chemistry.
- **Programming Languages:** Python (Pytorch, Numpy, Pandas, Matplotlib, Scikit Learn, Flask), Javascript (jQuery), C, C++, HTML/CSS (Tailwind, Bootstrap), MATLAB.
- **Other Skills:** Design and deployment of deep learning pipelines (cloud & on-site), collaboration with research teams; assembling deep learning servers and workstations. Cloud Technologies: AWS (Lambda, S3), Docker, VAST.AI, Lambda Labs; Database Systems: MongoDB, SQLite; CAD/3D Printing: Cura, Onshape; Leadership: Training and mentoring graduate student; teaching classes.