BEN LONNQVIST

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EDUCATION

2020-   **Ph.D. Candidate, COMPUTATIONAL NEUROSCIENCE**
EPFL (Swiss Federal Institute of Technology in Lausanne) | Lausanne, Switzerland
- Advisors: Prof. Michael H. Herzog, Prof. Martin Schrimpf
- Primary interests: neural network modelling of vision; computational neuroscience, psychophysics
- Teaching: Teaching assistant for Real Analysis 2020, 2021

2016-2020   **M.A. Hons, ECONOMICS and FINANCE**
University of Aberdeen | Aberdeen, Scotland
- First-class Honours degree; thesis: Optimal search in multi-armed bandit problems
- Relevant coursework: Econometrics, Mathematical and Statistical Methods in Economics, Stochastic processes, Understanding Statistics, Proof-based Microeconomics

RESEARCH

Publications

2021   **Lonnqvist, B.**, Bornet, A., Doerig, A., Herzog, M. H. (2021). A comparative biology approach to DNN modeling of vision: A focus on differences, not similarities. Publisher: *Journal of Vision.* DOI: https://doi.org/10.1167/jov.21.10.17

2020   **Lonnqvist, B.**, Clarke, A. D. F., Chakravarthi, R. (2019). Crowding in humans is unlike that in convolutional neural networks. Publisher: *Neural Networks.* DOI: https://doi.org/10.1016/j.neunet.2020.03.021

Pre-prints

2023   **Lonnqvist, B.***, Wu, Z.*, Herzog, M. H. (2023). Latent Noise Segmentation: How Neural Noise Leads to The Emergence of Segmentation and Grouping. *Under review at ICML.* https://arxiv.org/abs/2309.16515.

2022   **Lonnqvist, B.**, Machiraju, H., Herzog, M. H. (2022). A comment on Guo et al. (2022). arXiv preprint. DOI: https://doi.org/10.48550/arXiv.2208.01456.

2020   **Lonnqvist, B.**, Elsner, M., Hunt, A. R., Clarke, A. D. F. (2020). Modeling individual variation in visual search with reinforcement learning. PsyArXiv. DOI: https://doi.org/10.31234/osf.io/suj28.

Conference oral presentations

2023   **Lonnqvist, B.**, Wu, Z., Herzog, M. H. (2023). How object segmentation and perceptual grouping emerge in noisy variational autoencoders. Oral presentation at the *MODVIS Workshop of the 23rd Annual Meeting of the Vision Sciences Society (VSS).*

2022   **Lonnqvist, B.**, Bornet, A., Doerig, A., Herzog, M. H. (2022). Global Information Processing in Feedforward Deep Networks. Oral presentation at the *22nd Annual Meeting of the Vision Sciences Society (VSS).*

2019   **Lonnqvist, B.**, Clarke, A. D. F., Chakravarthi, R. (2019). Object Recognition in Deep Convolutional Neural Networks is Fundamentally Different to That in Humans. Oral presentation at the *18th annual meeting of the Scottish Vision Group (SVG).*

Conference poster presentations

2023   **Lonnqvist, B.**, Wu, Z., Herzog, M. H. (2023). How object segmentation and perceptual grouping emerge in noisy variational autoencoders. Poster presentation at the *23rd Annual Meeting of the Vision Sciences Society (VSS).*

2021   **Lonnqvist, B.**, Doerig, A., Bornet, A., Francis, G., Schmittwilken, L., Herzog, M. H. (2021). How crowding challenges (feedforward) convolutional neural networks. Poster presented at the *21st Annual Meeting of the Vision Sciences Society (VSS).* DOI: https://doi.org/10.1167/jov.21.9.2039.

Invited talks

2023   INCC, Université Paris Cité & CNRS Vision Group Symposium, Paris, France

2019   Psychology & Computer Science Research Groups, University of Essex, Britain, UK

Research Work Experience

Aug - 2020 -	**EPFL (Swiss Federal Institute of Technology in Lausanne) | Doctoral Assistant** • Doctoral Research Assistant in the NeuroAI Laboratory, and the Laboratory of Psychophysics • Core contributor to the open-source Python project Brain-Score: https://github.com/brain-score • Focus on deep learning and psychophysics
Mar - May *2018 - 2020*	**Aberdeen School of Psychology | Undergraduate Research Assistant** • Voluntary research assistant in the Consciousness, Attention, and Perception Lab • First-authored a paper that has now been published in *Neural Networks* • Using Python, Keras and NumPy, programmed several architectures of Deep Neural Networks and wrote testing environments to produce novel research on visual crowding in convolutional NNs • Used SSH tunneling to access a Linux high-power computing cluster
May - Aug *2019 - 2019*	**Aberdeen School of Psychology | Research Intern** • Summer research intern at the Eye Movements and Attention Lab • Using Python, modeled Bayes-optimal eye movements parameterized by human visual search data • Using MATLAB and PsychToolbox, wrote a visual search psychophysical experiment • Ran 65 participant-hours of eye tracking experiments using EyeLink hardware

Selected Awards and Funding

	Rank Prize Foundation Optoelectronics Studentship
2019	A £3000 studentship awarded for a summer research project.

Teaching and Students

2023-2024	Understanding Statistics	Teaching assistant *(MSc course on statistics)*
2021	Real Analysis	Teaching assistant *(BSc course on mathematics)*
2020	Real Analysis	Teaching assistant
2023-2024	Maya van Holk	MSc thesis *(co-advised with Elsa Scialom)*
2023-2024	Maisa Ben Salah	MSc thesis *(co-advised with Martin Schrimpf)*
2023	Clémentine Lévy-Fidel	MSc thesis
2023	Ismaïl Sahbane	ML4Science project *(MSc CS course project)*
2023	Jad Tala	ML4Science project
2023	Olena Zavertiaiva	ML4Science project
2023	Pauline Verchinine	ML4Science project
2023	Jennifer Ayer	ML4Science project
2023	Laurent Brock	ML4Science project
2022-2023	Zhengqing Wu	MSc Computational Neuroscience Minor Thesis
2022-2023	Merkourios Simos	MSc Semester Project

Academic service

	Reviewing
Journals	*Neural Networks, Neural Computation, Vision Research*