Ben Lonnqvist

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Education

2020- Ph.D. Candidate, Neuroscience
EPFL (Swiss Federal Institute of Technology in Lausanne) | Lausanne, Switzerland
- Laboratory of Psychophysics–PI: Prof Michael Herzog
- Primary interests: neural network modelling of vision; visual crowding; experimental design
- 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
- Quantitative focus in electives
- 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

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

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

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

2019 **Lonnqvist, B.**, Clarke, A. D. F., Hunt, A. (2019). Changes in Human Eye Movement Strategies Over Time. Talk presented at a meeting of the schools of Psychology and Computer Science at the University of Essex, Britain, UK.

Research Work Experience

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
- Pre-print under review by *PLOS Computational Biology*: https://psyarxiv.com/suj28/
- Using Python, modeled Bayes-optimal eye movements parameterized by human visual search data
- Using MATLAB and PsychToolbox, wrote the majority of a visual search psychophysical experiment
- Ran 65 participant-hours of eye tracking experiments using EyeLink hardware

Awards

Rank Prize Foundation Optoelectronics Studentship

2019 A £3000 studentship awarded for a summer research project.

Research visit support by the James S McDonnell Foundation Scholar Award in Human Cognition (PI: Dr A. Hunt)

2019 A £150 support for a research visit to the University of Essex in July 2019.

Teaching

Computational Neuroscience Minor Project | MSc Student Zhengqing Wu

2022- Supervision of MSc student Zhengqing Wu at EPFL on their Computational Neuroscience Minor Project on unsupervised segmentation in variational autoencoders.

Teaching assistant | Real Analysis

2020, 2021 Teaching assistant for the Real Analysis course for undergraduates at EPFL in 2020 and 2021.

Academic service

Reviewing

Journals *Neural Networks, Neural Computation*