Annabel Wing-Yan Fan

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PhD Candidate with 9 years of psychophysics research experience, specializing in technology-driven innovations in health and science through user-centered design principles. A strong believer in the power of immersive technology to connect all people.

SKILLS

Research: Research design, display gamma calibration, data analysis & visualization, scientific translation & prototyping, transdisciplinary collaboration, scientific communication to lay and technical audiences (1 first-author publication, 15 conferences).
Technical: Python, Jupyter Notebook, R, MATLAB, C#, Unity, Git, Docker, Meta Presence Platform, VR/MR Development.

EDUCATION

Ph.D. Integrative Program in Neuroscience, McGill University GPA: 4.0/4.0 2021–2026 (Expected Graduation)
M.A. Perception, Cognition & Cognitive Neuroscience, University of Toronto GPA: 3.85/4.0 2018–2019

RESEARCH EXPERIENCE

McGill University Montreal, QC
Graduate Researcher, Baldwin Vision Lab 2021–present

- Researching how age-related changes in spatiotemporal contrast sensitivity impact target detection in visual noise.
- Extending fundamental research for clinical application by investigating how aging vision impacts driving simulator performance in older adults using quantitative and qualitative (questionnaire) methods.
- Developed code for experiments and conducted data analysis (psychometric function fitting to model signal detection, bootstrapping to estimate confidence intervals, factor analysis and clustering analysis) in Python, Octave, and R.
- Performed gamma correction using a photometer to calibrate the experimental display.

Research Associate, Hess Lab 2020–2021

- Developed clinical measurement tools using Unity and C# for the treatment of lazy eye, as part of a research collaboration with industry partners; Novartis (pharmaceutical company) and Ubisoft (game development studio).
  - Designed and developed cross-platform software prototypes in C# based on scientific and technical requirements.
  - Collaborated with software engineers to translate prototypes into FDA-compliant digital medical products.
  - Identified and communicated the value of key design features to technical leads to drive organizational decisions.
- Optimized development environments for reproducibility using Docker, Jupyter Notebook, and Git.
- **Manuscript submitted for publication to Journal of Vision (JoV).**

Unity Developer, Hess Lab Summer 2018

- Investigated the use of Microsoft's HoloLens Mixed Reality (MR) technology in vision research by developing a psychophysics experiment and two proof-of-concept prototypes using Unity, C#, and Azure Web Services.
- Demonstrated initiative and commitment to reproducibility by developing sample projects and custom code libraries with thorough documentation to guide researchers working with the HoloLens.
- Conducted independent research to deliver recommendations for the feasibility and visual ergonomics of conducting research in mixed reality.

University of Toronto Toronto, ON
Graduate Researcher, Visual Cognitive Neuroscience Lab 2018–2020

- Investigated the influence of visual statistical processing on grasping behaviour using psychophysical methods.
- Collected and analyzed large, multi-dimensional data sets using 3D motion tracking, electromyography (EMG), multilevel modelling, and support vector machine classification in Python, R, and MATLAB.
- **Published a first-author article in Frontiers Psychology.**

LEADERSHIP & EXTRACURRICULAR ACTIVITIES

McGillXR Chief Executive Officer 2022–present

- Founder and current CEO of McGillXR, an organization that hosts extended reality (XR) events and connects students to local and international XR organizations with support from academic and industry sponsors.
- Developed and taught hands-on workshops on XR development for the Meta Quest 2 using Unity and C#.
- Organizing our first NeuroVR Hackathon for which 15,000 CAD in funding has been secured.

Microsoft Imagine Cup Americas World Finalist 2022

- Project lead for the VueForAll application, which used Azure Machine Learning and a data analytics approach to improve visual accessibility and player experience in the video game industry.
- Communicated our team's experiences and goals to a general audience in an interview with Xbox's Developer Blog.