

WALSHE, R. CALEN

Visual & Computational Neuroscientist

CONTACT



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calenwalshe



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Austin, TX



SKILLS

Cognitive Science

Bayesian Perception

Eye movements

Psychophysics

EEG

Signal Detection Theory

Signal Processing

Fourier Analysis

Image Quality Assessment

Data Science and

Machine Learning

Maximum Likelihood Estimation

Discriminant Analysis

Deep Learning

Reinforcement Learning

Bayesian Regression

Least Squares Regression

Logistic Regression

Generalized Linear Model

Bayesian Decision Theory

Bayesian Hierarchical Regression

Support Vector Machines

Monte Carlo Methods

Data Visualization

Software

Keras/TensorFlow

CUDA

Anaconda

ggplot/dplyr (tidyverse)

Eyelink

Linux

LaTeX

Psychtoolbox

Google Cloud Services

Google G Suite

Adobe Creative Suite

Programming

R

MATLAB

Python

Markdown

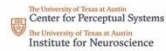
HTML/CSS

SQL

ABOUT ME

My work as a scientist has taken me in many directions that all have a common theme: to understand how the brain converts visual perception into intelligent action. The primary set of methods that I use in my research combines behavioral experiments and machine learning. The goal of the work is to develop algorithms that solve perceptual tasks such as object recognition and visual search in similar ways to humans. In basic research I have consistently delivered on funding awards by generating peer reviewed scientific publications, giving talks and presenting conference posters. In my work as an applied scientist I have helped stakeholders identify key insights for business and product development. Please don't hesitate to get in touch if you would like to know more about my background and skills!

WORK EXPERIENCE



Center for Perceptual Systems and Institute for Neuroscience, The University of Texas at Austin

Postdoctoral Researcher | August 2015 – Present

- Developed Bayesian optimal algorithms to search for and detect objects in natural scenes
- Published new theories about human vision and attention
- Improved state of the art deep learning methods to play ATARI games



Accelerate Internship, Enquiro Search Solutions

Research Intern | February 2009 – September 2011

- Worked with stakeholders to identify key research objectives and potential value
- Worked with a clinical population to measure neural correlates of brand preferences via EEG methods
- Implemented machine learning tools (SVM, Naive bayes, Neural Networks) to analyze EEG signals
- Generated written reports that guided future product design and business development



Graduate Research Fellow, The University of Edinburgh, Scotland

Researcher | September 2011 - March 2015

- Developed algorithms to detect saccadic eye movements with low latency and low error
- Conducted experiments to test biometric responses to visual stimuli
- Developed and published a toolbox for using maximum likelihood methods to estimate models of eye movements

EDUCATION



The University of Edinburgh, Edinburgh, Scotland

Ph.D. in Cognitive and Neural Sciences | Sept 2011 - May 2015

- Computational Visual Cognition lab
- Awarded competitive scholarships totaling \$120,000 over four years



Simon Fraser University, Burnaby, BC, Canada

Bachelor's in Cognitive Science | Jan 2005 - Feb 2009

- Artificial Intelligence concentration
- Editor Canadian Undergraduate Journal of Cognitive Science
- Research assistant for Robert Hadley (Neural Network Lab) Mark Blair (Cognitive Science Lab)

ACADEMIC CONTRIBUTIONS

- Walshe, R. C., & Geisler, W. S. Detection of occluding targets in natural scenes. (In Press at Journal of Vision)
- Walshe, R.C., & Nuthmann, A. Modelling fixation durations in natural scene perception tasks. (Under review at Computational Brain & Behavior)
- Ruohan, Z., Walshe, R.C. et al. (2020). Atari-HEAD: Atari human eye-tracking and demonstration dataset Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI-20)
- Walshe, R. C., Sebastian, S., & Geisler, W. (2018). Ideal observer for detection of occluding targets in natural scenes in the fovea and periphery. Journal of Vision, 18(10), 629-629
- Walshe, R.C. & Nuthmann, A. (2015). Mechanisms of saccadic decision making while encoding naturalistic scenes Journal of Vision, 15(21)
- Walshe, R.C. & Nuthmann, A. (2014). Asymmetric control of fixation durations in scene viewing. Vision Research, 100, 38-46