

# Alex Muhl-Richardson

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*I am a behavioural scientist and psychologist interested in new approaches to solving real-world problems. I have interests in human performance optimisation and individual differences in behaviour. I have extensive experience leading and managing research, including developing data collection methodologies, working with large datasets, data analysis, developing actionable insights and report writing.*

## Experience

### Psychologist

Human Performance Optimisation Centre, Beacon Red

Abu Dhabi, UAE

06/2024 - Present

- Research and Development Lead for the Human Performance Optimisation Centre at Beacon Red
- Leading human performance research, data analysis and behavioural insight development
- Engaging with clients, vendors and research partners to market and develop new human performance capabilities

### Senior Lecturer in Behavioural Science

Department of Communication and Applied Behavioural Science, Royal Military Academy Sandhurst

Camberley, UK

11/2021 - 06/2024

- Research Co-ordinator for behavioural science research, developed relationships with external research bodies
- Developing and delivering evidence-based courses for UK and international military audiences

### Research and Teaching Associate

Cognition and Motivated Behaviour Lab, Department of Psychology, University of Cambridge

Cambridge, UK

04/2021 - 11/2021

- Developed behavioural tasks for research on learning and memory, designed and delivered undergraduate teaching

### Research Associate

Visual Cognition Lab, Department of Psychology, University of Cambridge

Cambridge, UK

04/2018 - 04/2021

- Responsible for a series of projects on attention and cognition, including experimental design, data collection and writing papers

### Research Associate

Department of Psychology, Nottingham Trent University

Nottingham, UK

11/2017 - 04/2018

- Supported multiple projects across the department, contributing to experimental design, data collection and analysis and writing papers

## Education

### PhD Psychology

Centre for Vision and Cognition, School of Psychology, University of Southampton

Southampton, UK

2013 - 2018

- Main research project: Individual Differences in Dynamic Visual Search
- Led a four-year programme of research - developing research questions, experimental design, data collection, analysis and publishing papers
- Received PhD studentship (£85,502) from the Defence Science and Technology Laboratory, delivered outputs to government stakeholders

### MSc Psychological Research Methods (Distinction)

Department of Psychology, University of Sheffield

Sheffield, UK

2012 - 2013

- Main research project: The effects of autistic traits on social attention during deception, awarded Michael Siegal prize for best research project

### BA (Hons) Philosophy and Psychology (Upper Second Class)

Department of Psychology, University of Sheffield

Sheffield, UK

2009 - 2012

- Main research project: The effects of display medium on memory - a comparison of LCD and E Ink displays
- Carried out additional project to research and develop training for vibro-tactile sensory augmentation equipment for fire and rescue services

## Skills

### Behavioural Science

Experiment, survey and interview design, data collection, report writing, behavioural insights

### Research and Development

Research strategy, managing client and partner relationships, sourcing technology, capability development

### Statistics and Modelling

Significance testing, linear models, clustering, outlier detection, decision modelling, Bayesian inference

### Programming Languages

R, Python, MATLAB, JavaScript, SQL

## Projects

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### Human Performance Optimization Proof of Concept

Human Performance Optimisation Centre, Beacon Red

2024 → 2025

- This project involved the scoping, development and testing of a new human performance optimisation capability
- Identified appropriate technology to support project objectives, engaged suppliers of relevant hardware, software and services, including wearable technology, health data platforms and medical testing
- Analysed data from a diverse range of sources, designed data management and analysis pipelines, developed behavioural insights
- Ongoing review and development of this capability to move towards a full product offering

### Improving Human Performance in X-ray Baggage Screening

Visual Cognition Lab, Department of Psychology, University of Cambridge

2018 → 2021

- This project focussed on developing novel training to improve human performance while using the next generation of computed tomography baggage screening technology in airports
- Collected behavioural data from approximately 400 human research participants with applied visual search tasks programmed in Python and online with the Gorilla platform; conducted statistical analysis and modelling of decision-making, null hypothesis significance testing, Bayesian model comparisons and linear mixed-effects models
- Won funding from the Defence and Security Accelerator (worth £266,359), worked closely with government and industry stakeholders (e.g., Dstl, QinetiQ), outputs included three published papers and a library of three-dimensional computerised tomography images for training and security research

### Individual Differences in Dynamic Visual Search

Centre for Vision and Cognition, School of Psychology, University of Southampton

2013 → 2017

- This project examined the individual cognitive, affective and personality factors that can impact human attention and the relevance of this to complex real-world visual tasks, such as air traffic control
- I developed experimental tasks to collect behavioural responses, eye movements and physiological data from human participants, modelled human performance using Signal Detection Theory and conducted statistical analysis including linear mixed-effects models
- Outputs from this project included presentations at national and international conferences, two published papers and project pages available on Github ([github.com/alexmuhl-r/Dynamic-Visual-Search](https://github.com/alexmuhl-r/Dynamic-Visual-Search)) and the Open Science Framework ([osf.io/ahufd](https://osf.io/ahufd))

## Selected Publications

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1. Muhl-Richardson, A., Parker, M. G., & Davis, G. (2025). An evaluation of image enhancements in three-dimensional computed tomography baggage screening. *Applied Ergonomics*, 122, 104394. <https://doi.org/10.1016/j.apergo.2024.104394>
2. Muhl-Richardson, A., Tortosa-Molina, M., Recio, S. A., Parker, M. G., & Davis, G. J. (2022). Attenuating the “attentional white bear” effect enhances suppressive attention. *Attention, Perception, & Psychophysics*, 84(8), 2444–2460. <https://doi.org/10.3758/s13414-022-02560-w>
3. Muhl-Richardson, A., Parker, M. G., Recio, S. A., Tortosa-Molina, M., Daffron, J. L., & Davis, G. J. (2021). Improved X-ray baggage screening sensitivity with “targetless” search training. *Cognitive Research: Principles and Implications*, 6, 33. <https://doi.org/10.1186/s41235-021-00295-0>
4. Muhl-Richardson, A., Parker, M. G., & Davis, G. (2021). How the Zebra got its Rump Stripes: Salience at Distance and in Motion. *bioRxiv*. <https://doi.org/10.1101/2021.04.16.440148>
5. Muhl-Richardson, A., Godwin, H. J., Garner, M., Hadwin, J. A., Liversedge, S. P., & Donnelly, N. (2018). Individual Differences in Search and Monitoring for Color Targets in Dynamic Visual Displays. *Journal of Experimental Psychology: Applied*, 24(4), 564–577. <https://doi.org/10.1037/xap0000155>

## Selected Presentations

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1. Muhl-Richardson, A., Parker, M. G., & Davis, G. (2023). Visual Salience at Distance and in Motion: How the Zebra got its Rump Stripes. *Experimental Psychology Society London Meeting, University College London, UK*, Talk.
2. Muhl-Richardson, A., Parker, M. G., Tortosa-Molina, M., Recio, S. A., & Davis, G. (2020). The Attentional White Bear as a Failure of Proactive Suppression. *Object, Perception, Attention & Memory Conference, Austin, USA*, Talk.
3. Muhl-Richardson, A., Recio, S. A., & Davis, G. (2018). Distractor Suppression in Visual Search. *Applied Vision Association Christmas Meeting, Birkbeck, University of London, UK*, Poster.