Exponent®
Engineering & Scientific Consulting

Jack Hutchinson, Ph.D.

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Professional Profile

Dr. Hutchinson uses his expertise in applied psychology to examine human behavior in complex, safety-critical contexts across a variety of products and industries, including human machine interfaces, software for control systems, and physical working environments for on-road, rail, mining, public transportation infrastructure, and utilities.

Dr. Hutchinson's work experience has focused on end-to-end human factors integration for the development of complex systems and products. He conducts both formative and summative human factors studies and provides expert analysis and consulting services. His work encompasses both the identification and management of human factors risk, and complex system design to account for human capability and limitations. He also has experience evaluating regulatory compliance across product development lifecycles.

His consulting approach integrates human factors techniques such as task analysis, error analysis, ergonomic assessment, interface design review, and usability assessments to promote risk management, system integration, and compliance with human factors system and regulatory requirements.

Prior to joining Exponent, Dr. Hutchinson served as a Senior Human Factors Consultant at a boutique consultancy that provided Human Factors Integration services to a range of major clients in safety-critical industries, such as rail, mining, and transport infrastructure. He has a PhD from the University of Western Australia (UWA) in Industrial & Organizational Psychology, specializing in Human Factors. Dr. Hutchinson also completed his Master's of Industrial & Organizational Psychology and Undergraduate degree with Honors in Psychology at UWA. Before joining Exponent, he worked as an Environmental Health and Safety Consultant where he supported multidisciplinary team delivering solutions to clients across a range of industries, transforming approaches to psychological and physical health and safety.

Dr. Hutchinson has published several peer-reviewed articles as part of his academic research, including in journals such as *Human Factors* and *Applied Ergonomics*. His research focused on human perceptions of automation reliability and the impact of these perceptions on automation misuse and disuse. He is also an iESM (International Engineering Safety Management) approved practitioner.

Academic Credentials & Professional Honors

Ph.D., Industrial and Organizational Psychology, The University of Western Australia, 2022

MIOP, Industrial and Organizational Psychology, The University of Western Australia, 2022

B.S., Psychological Sciences, The University of Western Australia, 2017

HDR Scholarship, Australian Government, 2018

Academic Appointments

Academic Tutor, Psychology Department, The University of Western Australia, 2018-2021

Academic Tutor, UWA Business School, The University of Western Australia, 2018-2021

Prior Experience

Senior Human Factors Consultant, HF Integration, Perth – Western Australia, 2024 -2026

Human Factors Consultant, HF Integration, Perth – Western Australia, 2023 – 2024

Health & Safety Consultant, Ernst & Young, Perth – Western Australia, 2022 – 2023

Academic Researcher, UWA Human Factors & Applied Cognition Lab, Perth – Western Australia, 2018 – 2021

Publications

Hutchinson J, Strickland L, Farrell S, Loft S. The perception of automation reliability and acceptance of automated advice. Human Factors 2023; 65(8):1596–1612.

Hutchinson J, Strickland L, Farrell S, Loft S. Human behavioral response to fluctuating automation reliability. Applied Ergonomics 2022; 105:103835.

Strickland L, Farrell S, Wilson MK, Hutchinson J, Loft S. How do humans learn about the reliability of automation? Cognitive Research: Principles and Implications 2024; 9(1):8.

Project Experience

Conducted alarm rationalization and medium-high fidelity usability testing of the alarm interface for a train control system used by railroad controllers and maintenance personnel; provided guidance on usability of alarm presentation and viewer functionality and reduced the opportunity for alarm flooding.

Conducted a human factors design review of a proposed control center, focusing on components such as layout, operator team interfacing, and ambient lighting and noise; provided design recommendations with respect to operator communication pathways, ambient noise, and operator distraction and disruption.

Conducted a gap analysis to assess organizational gaps in psychosocial risk management in relation to the introduction of new state and national legislative and regulatory requirements; provided a detailed analysis of potential critical gaps, and provided guidance around associated risk.

Supported a large-scale maturity assessment of an environmental health & safety management system and broader organizational culture at a statewide utility services provider, including qualitative and quantitative data collection (e.g., on-site inspections, interviews, survey); provided an industry benchmarked assessment against key maturity criteria, as well as findings mapped against previous assessment outcomes.

Conducted medium-high fidelity usability testing of the user interface software used onboard a fleet of rail-mounted vehicles (e.g., locomotives, track-maintenance machines, hi-rails); assessed software usability to support driver tasks and analyzed and advised on the opportunity for human error.

Conducted a human factors design review of a proposed wayside signage to support an upgraded signaling system on a large private rail network; provided design recommendations on readability and saliency, as well as presentation and positioning of required information.

Supported a human factors risk assessment of a large metropolitan train station post-construction, assessing both mitigated and residual risk on-site; provided human factors analysis pertaining to addressed design changes, and recommendations around residual risk.

Conducted a human factors risk assessment of remote and local conveyor belt isolation processes for low and high voltage systems at a large regional mine site; identified potential vulnerabilities for human error, and provided analysis of Human Error Probabilities (HEPs) using the Human Error Assessment and Reduction Technique (HEART).

Led research focusing on human automation teaming, specifically human perception of automation reliability and the impact of these perceptions on automation misuse and disuse; conducted extensive literature review, research design and planning, data collection, quantitative data analysis, and journal article development. Published two first author journal publications.