Eric Spero, PhD
Lecturer in Cyber Security
School of Computer Science
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EDUCATION

Doctor of Philosophy, Computer Science June 2023
Carleton University, Ottawa, Canada
Thesis: *User Interfaces, Mental Models, and Cybersecurity*
Supervisor: Robert Biddle

Master of Arts, Human–Computer Interaction June 2018
Carleton University, Ottawa, Canada
Thesis: *A Non-Linear Electronic Textbook Format to Facilitate Deep Learning*
Supervisors: Robert Biddle, Ali Arya

Bachelor of Cognitive Science (Honours), Cognitive Science Nov. 2014
with specialization in Language and Linguistics
Carleton University, Ottawa, Canada
Thesis: *Construction Grammar and the Argument–Adjunct Distinction*
Supervisor: Ida Toivonen
Graduated with high distinction

ACADEMIC EMPLOYMENT

Lecturer in Cyber Security June 2026–present
University of Auckland
Auckland, New Zealand
- Appointed to a teaching and research role in cyber security within the School of Computer Science
- Establishing a research programme on security decision-making support for human constraints, including limited attention, incomplete knowledge, time pressure, and competing priorities

Research Fellow Dec. 2024–May 2026
University of Auckland
SECRET Lab
Auckland, New Zealand
Supervisor: Giovanni Russello
- Led empirical analysis and interpretation for a large-scale simulated phishing study with a Pasifika government agency
- Developed the conceptual framing and wrote the manuscript for the SOUPS 2025 paper *Language as Lure: A Naturalistic Study on Pasifika Phishing Susceptibility*
- Provided research guidance to PhD students across usable-security projects, including developer-facing security support and AI-assisted phishing detection, assisting with research design, analysis, and academic writing

Research Associate June 2023–Dec. 2024
Carleton University
HotSoft Research Group
Ottawa, Canada
Supervisor: Robert Biddle
- Extended doctoral research through additional analyses of prior study data, contributing to follow-up publications

- Conducted statistical analyses of longitudinal phishing-simulation data and reported findings through research meetings and project reports
- Supported human-centered security research projects through study deployment coordination, literature review, and undergraduate Honours supervision

Research Intern, NSERC CLUE Program May 2019–Apr. 2020
National Research Council Canada
Flight Research Laboratory
Ottawa, Canada
Supervisor: Andrew Law, PhD (Biomedical Engineering)

- Analysed functional neuroimaging data from cognitive-performance tasks using MATLAB to examine links between behavioural and neural measures
- Adapted ACT-R models of cognitive-performance tasks in LISP and evaluated model outputs against human-subject data
- Documented procedures for modifying an Angular-based software simulation of the Centre for Air Travel Research (CATR) airport-terminal facility

Research Assistant May 2018–June 2023
Carleton University
HotSoft Research Group
Ottawa, Canada
Supervisor: Robert Biddle

- Built a prototype evidence-browser web application for intelligence analysis using JavaScript, Node.js, and MongoDB
- Supported HCI and usable-security research through workshops, student-orientation presentations, and research-methods training
- Collected quantitative and qualitative observational data for course-related educational research

PUBLICATIONS

Manuscripts Under Review / In Preparation

Y. Xue, **E. Spero**, M. W. Woo, and W. Gao. Beyond binary labels: a benchmark schema for fine-grained phishing detection evaluation. Manuscript submitted to the 2026 Conference on Empirical Methods in Natural Language Processing (EMNLP) 2026, 2026

- Contribution: Benchmark schema design; contribution framing and paper scoping; manuscript writing; dataset licensing/release analysis

T. Lu, **E. Spero**, S. H. Jayasundara, R. Biddle, G. R. S. of Computer Science, U. of Auckland, and N. Zealand. R+r: reassessing java security api misuse in current llms: a replication on jca and jsse apis with external security knowledge. In 2026. URL: https://arxiv.org/abs/2605.31135. Manuscript submitted to the 20256 IEEE Annual Computer Security Applications Conference (ACSAC)

- Contribution: Conceptual framing; analysis support and manuscript feedback

E. Spero and R. Biddle. Managing security under limited attention: the "Home–Away" model of home and online security, 2026. URL: https://doi.org/10.2139/ssrn.6212349. Manuscript submitted to Behaviour and Information Technology

L. Betts, **E. Spero**, R. Biddle, D. Lottridge, and G. Russello. Visibility-aware html analysis through renderer-level extraction. Manuscript submitted to the 2026 APWG Symposium on Electronic Crime Research (eCrime), 2026

- Contribution: Advisory input and manuscript feedback

J. Recommendable, **E. Spero**, R. Biddle, G. Russello, and D. Lottridge. SoK: in-context human-centred anti-phishing interventions. Manuscript in preparation for journal submission, 2026

- Contribution: Conceptual framing; analysis support and manuscript feedback

T. Lu, **E. Spero**, M. R. V. Chaudron, R. Biddle, and G. Russello. Security errors in software development: a review of theory-based human factors and interventions. Manuscript submitted to ACM Computing Surveys, 2025

- Contribution: Conceptual structure; manuscript revisions

Y. Xue, **E. Spero**, Y. S. Koh, and G. Russello. MultiPhishGuard: an LLM-based multi-agent system for phishing email detection. Manuscript in preparation for submission to APWG Symposium on Electronic Crime (eCrime) 2026, 2025. URL: https://arxiv.org/abs/2505.23803

- Contribution: Statistical analysis; manuscript writing; expert phishing judgments and rationale annotation

Peer-Reviewed Journal Articles

E. Spero and R. Biddle. Site Inspector: improving browser communication of website security information. *ACM Transactions on Privacy and Security*, Apr. 2025. DOI: 10.1145/3726867

M. Stojmenović, **E. Spero**, M. Stojmenović, and R. Biddle. What is beautiful is secure. *ACM Transactions on Privacy and Security*, 2022. DOI: 10.1145/3533047

- Contribution: Led statistical analysis and interpretation; literature synthesis and manuscript development

Peer-Reviewed Conference Papers

E. Spero, L. Betts, I. Seow, E. Fuatimau, R. Biddle, D. Lottridge, and G. Russello. Language as lure: a naturalistic study on Pasifika phishing susceptibility. In *Twenty-First Symposium on Security and Privacy (SOUPS) 2025*, Seattle, WA, USA. USENIX, 2025. URL: https://www.usenix.org/conference/soups2025/presentation/spero

L. Betts, **E. Spero**, D. Lottridge, R. Biddle, and G. Russello. Detecting malicious email content concealment with text similarity metrics. In *Pacific Asia Conference on Information Systems (PACIS) 2025*, Kuala Lumpur, Malaysia. AIS, 2025. URL: https://aisel.aisnet.org/pacis2025/security/security/6

- Contribution: Statistical analysis and visualization support; manuscript feedback

E. Spero and R. Biddle. Out of sight, out of mind: UI design and the inhibition of mental models of security. In *New Security Paradigms Workshop (NSPW) 2020*, Online, USA. ACM, 2020. DOI: 10.1145/3442167.3442174

E. Spero and R. Biddle. Home and away: UI design patterns for supporting end-user security. In *2020 European Conference on Pattern Languages of Programs (EuroPLoP)*, Virtual event, Germany. ACM, July 2020. DOI: 10.1145/3424771.3424780

E. Spero, M. Stojmenović, S. Chiasson, and R. Biddle. Control and understanding in malware and legitimate software. In *2019 APWG Symposium on Electronic Crime Research (eCrime)*, Pittsburgh, PA, USA. IEEE, Nov. 2019. DOI: 10.1109/eCrime47957.2019.9037597

M. Stojmenović, **E. Spero**, T. Oyelowo, and R. Biddle. Website identity notification: testing the simplest thing that could possibly work. In *17th International Conference on Privacy, Security and Trust (PST)*, Fredericton, Canada. IEEE, Aug. 2019. DOI: 10.1109/PST47121.2019.8949048

- Contribution: Statistical analysis support; results interpretation

E. Spero, M. Stojmenović, A. Arya, and R. Biddle. Learning with trees: a non-linear e-textbook format for deep learning. In *Learning and Collaboration Technologies. Designing Learning Experiences.* 21st International Conference on Human-Computer Interaction (HCII), Orlando, FL, USA. Springer, July 2019. ISBN: 978-3-030-21814-0. DOI: 10.1007/978-3-030-21814-0_31

Peer-Reviewed Poster Papers

Z. Husein, **E. Spero**, and R. Biddle. Do passkey explanations discourage adoption? In *Proceedings of HCI International 2026*. Springer, 2026

E. Spero, M. Stojmenović, Z. Hassanzadeh, S. Chiasson, and R. Biddle. Mixed pictures: mental models of malware. In *17th International Conference on Privacy, Security and Trust (PST)*, Fredericton, NB, Canada. IEEE, Aug. 2019. DOI: 10.1109/PST47121.2019.8949030

E. Spero, M. Stojmenović, and R. Biddle. Helping users secure their data by supporting mental models of VeraCrypt. In *HCI International 2019 - Posters, Part I*, Orlando, FL, USA. Springer, July 2019. DOI: 10.1007/978-3-030-23522-2_27

Non–Peer-Reviewed Conference Papers

E. Spero and R. Biddle. Security begins at home: everyday security behaviour and lessons for cybersecurity research. In *26th Conference on Pattern Languages of Programs (PLoP)*, Ottawa, ON, Canada. ACM, Oct. 2019. URL: https://dl.acm.org/doi/10.5555/3492252.3492279

SELECTED RESEARCH PROJECTS

Language and Cultural Effects on Pasifika Phishing Susceptibility June 2024–Feb. 2025

- Led analysis and manuscript development for a large-scale naturalistic phishing study with a Pasifika government agency
- Analysed multilingual phishing-email outcomes from approximately 2,000 participants using generalized estimating equations
- Found that Pasifika-language phishing emails elicited higher click rates than English versions when framed as personal requests for assistance
- Interpreted results through psycholinguistic accounts of the foreign-language effect and anthropological accounts of Pasifika helping norms

***Site Inspector*: Improving Browser Communication of Website Security Information** Feb. 2022–Feb. 2023

- Designed a browser-based UI tool that communicates website identity information from X.509 certificates, exemplifying the SAVE paradigm by increasing visibility into security-relevant system state
- Implemented the tool as a Firefox extension using JavaScript, HTML, and CSS
  - Download link: https://addons.mozilla.org/en-US/firefox/addon/site-inspector/
- Evaluated the tool in a 30-participant user study, finding that it substantially improved users' ability to detect fraudulent websites

Security Awareness and Visibility Evaluation (SAVE): Interface Visibility for Security Decision-Making Feb. 2020–Dec. 2020

- Examined how software UIs conceal security-relevant system behaviour, preventing users from forming accurate mental models.
- Conducted three illustrative case studies showing how lack of visibility leads to insecure decision-making.
- Outlined UI design principles informed by Ecological Interface Design to improve users' perception and interpretation of security-relevant system state.

The *Home–Away* Security Model: Supporting Everyday Security Reasoning in Digital Systems Oct. 2019–May 2021

- Developed the *Home–Away* model through a focus group and follow-up interviews, identifying recurring everyday-security behaviours including context assessment, dissuasion, checking, monitoring, and insurance
- Mapped physical-world security practices to digital contexts, developing UI design patterns to support user reasoning about cybersecurity threats

- Evaluated the model through ten one-on-one interviews and a 100-item online questionnaire ($n = 250$)
- Performed thematic analysis of interview data and Bayesian analysis of questionnaire responses using R and JAGS, providing convergent empirical support for the model

TEACHING EXPERIENCE

Course Instructor July–Nov. 2025
University of Auckland
Auckland, New Zealand
COMPSCI 725: Usable Security and Privacy Engineering

- Designed and independently taught a new 76-student postgraduate course examining cybersecurity systems through the interaction of technical mechanisms, user interfaces, and human decision-making
- Structured the course around guided, research-paper–based discussions, modeling expert reasoning about system assumptions, trade-offs, and design constraints imposed by human cognition
- Designed authentic assessments including a research-style usable security study proposal, oral presentation, and final exam
- Fostered inclusive participation through multiple engagement modes, including anonymous in-class written discussion (Mentimeter)
- Received strong student evaluations, with 92% of respondents generally agreeing that the course quality and teaching were high ($n = 39$)

Course Tutor (Instructor Responsibilities) Feb.–June 2025
University of Auckland
Auckland, New Zealand
COMPSCI 727: Cryptographic Management

- Delivered a full guest lecture and chaired four weeks of research-presentation sessions
- Graded oral presentations and research papers and provided detailed feedback

Teaching Assistant Sept. 2015–May 2022
Carleton University
Ottawa, Canada

- *Courses:* Introduction to Programming and Problem Solving (BIT 1400), Intermediate Programming (BIT 2400), Introductory Psychology (PSYC 1000), Introduction to Cognitive Psychology (PSYC 2700), Computing for Arts Students (COMP 1001), Human-Computer Interaction (COMP 3008)
- Explained technical concepts using everyday language and helped students improve their work through tutorials, office hours, email correspondence, and assessment feedback

HONOURS & AWARDS

Senate Medal for Outstanding Graduate Work (Doctoral) 2023
Carleton University
Faculty-level medal recognizing outstanding doctoral research and thesis quality.

Senate Medal for Outstanding Academic Achievement (Undergraduate) 2014
Carleton University
Awarded to the top 3% of the graduating class in the degree program.

SCHOLARSHIPS

Alexander Graham Bell Canada Graduate Scholarship (CGS-D) 2020–2023
Natural Sciences and Engineering Research Council of Canada (NSERC)
$35,000 CAD per year for three years; Canada's premier national doctoral scholarship in science and engineering.

Ontario Graduate Scholarship (OGS) 2019
Government of Ontario
$15,000 CAD; competitive, merit-based provincial graduate scholarship.

CONFERENCE PRESENTATIONS

Indigidata Aotearoa	Nov. 2025
Symposium on Usable Privacy and Security (SOUPS)	Aug. 2025
Pacific Asia Conference on Information Systems (PACIS)	July 2025
New Security Paradigms Workshop (NSPW)	Oct. 2020
Annual Meeting of the Cognitive Science Society (CogSci) (poster)	July 2020
Symposium on Electronic Crime Research (eCrime)	Nov. 2019
International Conference on Human-Computer Interaction (HCII)	July 2019

RESEARCH METHODS AND TECHNICAL SKILLS

Research: Human-participants research; experimental design; usability evaluation; mixed methods; qualitative analysis; literature synthesis; academic and technical writing

Statistical & Computational Analysis: Quantitative behavioural data analysis; applied statistical modelling; Bayesian and frequentist analysis; survey and experimental data analysis; reproducible workflows in R

Technical: R; Python; MATLAB; JavaScript/HTML/CSS; Linux/Bash; C/C++; SQL; LISP/ACT-R; LaTeX

OPEN-SOURCE AND SYSTEMS ENGAGEMENT

- Author of the *foreground* patch for the `dwm` window manager (https://dwm.suckless.org/patches/foreground/; implemented in C)
- Operated self-hosted email (Postfix/Dovecot), web (Apache/Nginx), and XMPP (Prosody) services
- Submitted kernel and system-level bug reports to upstream projects (e.g. https://bugzilla.kernel.org/show_bug.cgi?id=215880)
- Volunteer technical support within the Gentoo Linux community (Discord)