Stan Nowak, PhD

Principal Designer & Researcher

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I design, build, and evaluate interactive visualization systems that support complex decision-making under uncertainty. My work bridges applied research and production software—currently focused on avalanche safety tools used by forecasting agencies across Canada and the United States.

RESEARCH INTERESTS: Visual Analytics, Sensemaking, Human-Computer Interaction, Information Visualization, Decision Support Systems

EDUCATION

PhD — Simon Fraser University   2017–2023

SUPERVISION: Lyn Bartram, Pascal Haegeli, Wolfgang Stuerzlinger

Thesis: Visual Analytics to Support Complex Sensemaking under Ambiguity

BA, Cognitive Systems: Cognition and the Brain — University of British Columbia   2009–2014

EXPERIENCE

Principal Designer & Researcher — Avalanche Canada   2023–present

Remote / Revelstoke, Canada

Lead designer and researcher at Avalanche Canada, responsible for all digital products used by 140,000+ public users and 60+ professional forecasters across Avalanche Canada, the Colorado Avalanche Information Center (CAIC), and Parks Canada.

- Shipped **AvIDdx**, the primary forecaster analysis tool in Canada and Colorado. Integrates weather, field observations, snowpack models, and satellite data into one workspace—moving forecasting from purely experiential methods toward quantitative, human-machine approaches.
- Shipped **AvObs**, a tool for analyzing observed avalanches to characterize hazard conditions. Evolved from PhD research into a production system used daily by forecasters.
- Designed and built **WxObs**, a weather monitoring tool aggregating hundreds of sources (weather stations, snow pillows, ski resorts, snow study plots). Includes a metadata management system and QA/QC pipeline for sub-daily timescales— uncommon in operational meteorology.
- Redesigned public-facing elements of avalanche.ca: danger rating legend, colorblind-safe palette, and a custom basemap showing peaks, trailheads, and landmarks with satellite imagery at close zoom.
- Built a **place search system** with ranking based on usage patterns, location type, popularity, and proximity.
- Created a **user research panel** profiling backcountry users by experience, activity, and region, linked to site analytics (Mixpanel). Standing participant pool for studies.
- Designed the **CAIC highway forecast email**—daily briefing for snow plow crews in Colorado and Alaska. Low-tech, robust.
- Initiated a **Statistics Canada** partnership to add backcountry recreation to a national survey (results early 2027)—first reliable estimate of avalanche-exposed population in Canada.
- Leading design strategy for next-generation forecasting: model-driven, location-specific hazard products replacing hand-drawn regional forecasts. New app with CAIC launching beta March 2026.
- Mentoring a junior designer and coaching management on design practice. Embedded in dev team: write code, review PRs, build prototypes for production handoff. Partner with research officer on modeling strategy and user research. Driving user-centered thinking across the organization through reading groups, workshops, and cross-team collaboration.

Graduate Research Assistant — Vancouver Institute for Visual Analytics   2017–2023

Burnaby, Canada

SUPERVISION: Lyn Bartram

Designed and developed interactive visualizations for clients including Avalanche Canada, BC Cancer Research Centre, and SFU departments. Developed and delivered courses on visualization. (D3.js, Tableau, Python)

PhD Research Intern — Autodesk
2022

Toronto, Canada

SUPERVISION: Justin Matejka, Bon Adriel Aseniero, Tovi Grossman, Lyn Bartram, George Fitzmaurice

Explored the intersection of visual analytics and architectural CAD through three participatory design studies with professional architects investigating how interactive visualizations could integrate building codes into the design process.

Graduate Research Assistant — SFU Avalanche Research Program
2019–2020

Burnaby, Canada

SUPERVISION: Pascal Haegeli & Lyn Bartram

Conducted human-centered research with public avalanche forecasters to inform the design of visual analytics tools. Developed visualization prototypes for exploratory analysis of physical snowpack models. (D3.js, Tableau, Svelte)

Visualization Consulting — Self-employed
2016–2017

Vancouver, Canada

Analytics and visualization for clients in business intelligence, data journalism, and retail supply chain. (D3.js, Tableau, Python)

Visualization Instructor & Consultant — Vancouver Institute for Visual Analytics
2015–2017

Burnaby, Canada

Visual analytics training for academics and professionals; analytics consulting for industry clients. (D3.js, Tableau, Python)

Earlier Roles

Cofounder — BuckMeUp.com 2014–2017. Designed and developed front-end of a freelance marketplace. (AngularJS)

Research Assistant — UBC Communication Dynamics Lab 2014–2016. Developed software for audiovisual perception experiments. Supervision: Eric Vatikiotis-Bateson. (Python, Blender)

Research Assistant — UBC Visual Cognition Lab 2013–2014. Developed software for experiments on stress and visual cognition; investigated neurofeedback-training effects on performance. Supervision: Ron Rensink. (Matlab, Python)

Directed Studies — UBC Communication Dynamics Lab 2012. Investigated non-invasive motion-detection from 2D video for monitoring children with sleep disorders. Supervision: Eric Vatikiotis-Bateson & Osman Ipsiroglu. (Matlab)

PUBLICATIONS

Thesis

Stan Nowak (2023). Designing for ambiguity in sensemaking: Visual analytics in risk analysis and prediction. *Ph.D. thesis, Simon Fraser University.*

Journal Articles

Stan Nowak & Lyn Bartram (2023). Designing for Ambiguity in Visual Analytics: Lessons from Risk Assessment and Prediction. *IEEE Transactions on Visualization and Computer Graphics.*

Stan Nowak, Bon Adriel Aseniero, Lyn Bartram, Tovi Grossman, George Fitzmaurice, Justin Matejka (2023). Identifying Visualization Opportunities to Help Architects Manage the Complexity of Building Codes. *IEEE Computer Graphics & Applications.*

Stan Nowak, Miriam Rosing, Wolfgang Stuerzlinger, & Lyn Bartram (2021). Integrating Clinical Knowledge in the Analysis of Natural Histories of Oral Cancer through Visual Analytics. *Frontiers in Oral Health.*

Simon Horton, **Stan Nowak**, & Pascal Haegeli (2019). Enhancing the operational value of snowpack models with visualization design principles. *Natural Hazards and Earth System Sciences.*

Robert A. Fuhrman, **Stan Nowak**, & Eric Vatikiotis-Bateson (2016). Evaluating how fine-grained changes in the spatial and temporal properties of audiovisual speech influence the perception of linguistic meter. *The Journal of the Acoustical Society of America.*

Conference Proceedings (Refereed)

Grant Helgeson, **Stan Nowak**, et al. (2023). The AvID Project: Collaborative Solutions to Avalanche Forecasting Challenges. *ISSW 2023.*

Simon Horton, Pascal Haegeli, ..., **Stan Nowak**, et al. (2023). Is it a problem? Takeaways from research into the use and effectiveness of avalanche problems. *ISSW 2023.*

Stan Nowak, Pascal Haegeli, & Lyn Bartram (2023). Designing digital tools to support handoff at shift changes in avalanche forecasting. *ISSW 2023.*

Stan Nowak & Lyn Bartram (2022). I'm Not Sure: Designing for Ambiguity in Visual Analytics. *Graphics Interface.*

Stan Nowak, Lyn Bartram, & Pascal Haegeli (2020). Designing for Ambiguity: Visual Analytics in Avalanche Forecasting. *IEEE Visualization Conference.*

Stan Nowak, Lyn Bartram, & Thecla Schiphorst (2018). A Micro-Phenomenological Lens for Evaluating Narrative Visualization. *IEEE BELIV.*

Simon Horton, Stan Nowak, & Pascal Haegeli (2018). Exploring regional snowpack patterns with gridded models. *ISSW 2018.*

Workshop Papers

Stan Nowak & Lyn Bartram (2022). Give Me the Data: Visual Analytics Needs to Go Beyond Visualization. *ASCR Workshop on Visualization for Scientific Discovery, Decision-Making, & Communication.*

PROFESSIONAL SERVICE

Reviewer: CHI (2025), IEEE VIS (2025), PacificVis (2026), Graphics Interface, EuroVis

SKILLS

Design & Research	User research, participatory design, usability testing, prototyping, information design, cartographic design, data visualization
Development	JavaScript, Svelte, React, D3.js, MapboxGL, WebGL, Python, SQL, HTML/CSS
Tools	Figma, Tableau, Mixpanel, Git

TALKS

Interactive Visualizations for Avalanche Hazard Assessment — Canadian Avalanche Association Spring Meeting	2021
Designing for Ambiguity: Visual Analytics in Avalanche Forecasting — IEEE Visualization Conference	2020
Visual Analytics in Avalanche Forecasting — Western Innovation Forum, Burnaby	2020
Visualization Design, Analysis, and Visual Thinking — SFU SciProg Workshop	2020
Designing Visualization Tools for Avalanche Forecasters — CAA Spring Meeting, Penticton	2019
Principles of Data Visualization and Interpretation — SFU SciProg Workshop	2019
Data Visualization: A Brief Introduction — UBC Cognitive Systems Guest Lecture	2019
A Micro-Phenomenological Lens for Evaluating Narrative Visualizations — BELIV Workshop, Berlin	2018

AWARDS & FELLOWSHIPS

Helmut & Hugo Eppich Family Graduate Scholarship	2022 · $1,200
President's PhD Scholarship	2021 · $7,500
FCAT Graduate Fellowship	2021 · $3,500
Andrew Wade Memorial Scholarship in Visual Analytics	2020 · $7,500
Van Pykstra Graduate Scholarship	2020 · $3,700
Graduate Fellowship	2020 · $6,500
SFU Big Data Graduate Scholarship	2019 · $6,500
Graduate Fellowship	2019 · $3,250
FCAT Graduate Fellowship	2019 · $3,250
Andrew Wade Memorial Scholarship in Visual Analytics	2018 · $6,800
Travel & Minor Research Award (IEEE VIS)	2018 · $1,000

TEACHING

Andrew Wade Student Workshops — Instructor 2015–2017
VIVA, UBC & SFU. Developed and delivered 12–week introductory visual analytics course.

Visual Analytics Half-Day Course — Instructor 2017
Developed and delivered introduction to visual analytics for engineering students.

Visual Analytics Courses — Teaching Assistant 2018–2019
Multiple courses for corporate clients, BC Government, climate researchers, and SFU SIAT. Instructor: Lyn Bartram.

Management Information Systems — Teaching Assistant 2016
UBC Sauder School of Business. Instructor: Alym Amlani.

Analytics and Interpretation for Applied Sciences — Teaching Assistant 2016–2017
Developed and delivered lab component. Instructor: Iain Begg.

SFU Continuing Studies Visual Analytics Certificate 2016
Aided the development of two continuing studies courses on visual analytics.