Bridger Herman

bridger-herman.github.io
@ herma582 at umn dot edu

Education

2018-2023 (expected) | **Ph.D., Computer Science** — University of Minnesota – Minneapolis, MN
- Advisor: Daniel F. Keefe
- Specializations: Data visualization, mixed reality, data physicalization

2018-2020 | **M.S., Computer Science** — University of Minnesota – Minneapolis, MN
- Specializations: Data visualization, mixed reality, data physicalization

2014-2018 | **B.S., Computer Science** — University of Minnesota – Minneapolis, MN
- Specializations: Computer graphics, virtual reality
- Minor in mathematics

Spring 2017 | **Study Abroad** — University of Auckland – Auckland, New Zealand
- Courses: Computer Graphics, User Interface Design, New Zealand Conservation, Māori Language

Teaching Experience

Fall 2020 | **Instructor** — University of Minnesota – Minneapolis, MN

Course: CSCI 1133 – Introduction to Computing and Programming Principles
- Designed remote lectures for 40 students
- Created learning assessment materials
- Administered remote oral exams
- Managed a team of undergrauate TAs

Python | Markdown | OBS Studio | Zoom | gather.town | reveal.js

Fall 2019 | **Teaching Assistant** — University of Minnesota – Minneapolis, MN

Course: CSCI 4611 – Programming Interactive Computer Graphics and Games
- Created new written assignments to accompany existing programming projects with the purpose of emphasizing understanding of computer graphics concepts
- Graded written and programming assignments
- Extended existing grading scripts for the course

C++ | Markdown | Python

Fall 2018 | **Teaching Assistant** — University of Minnesota – Minneapolis, MN

Course: CSCI 5619 – Virtual Reality and 3D Interaction
- Wrote three tutorials on developing virtual reality applications with Unity and Unreal game engines
- Led aforementioned tutorials for two-hour sessions with about 50 students
- Graded student programming assignments

C# | Unity Engine | Unreal Engine | LaTeX

2015-2018 | **Undergraduate Teaching Assistant** — University of Minnesota – Minneapolis, MN

Course: CSCI 1133 – Introduction to Computing and Programming Concepts
- Taught lab sections of about 30 students
- Formulated new course material for labs
- Graded weekly programming assignments, quizzes, exams
- Developed collaborative Python homework-grading script

Python

Research Experience

Research interests: using virtual and augmented reality to visualize time-varying spatial data; using digital fabrication techniques to make data tangible; making visualizations accessible to more people through artist-curated, nature-inspired artifacts and diverse display media

2018-Present | Research Assistant — University of Minnesota – Minneapolis, MN

- Developed mixed reality applications for data visualization with the Unity engine and C#
- Crafted a web-based, cross-platform user interface designed for use by artists to create engaging data visualizations
- Created a socket-based network communication infrastructure for mixed reality user interfaces
- Collaborated on several multi-disciplinary projects involving teams at the University of Minnesota Twin Cities, the University of Texas at Austin, and other universities

C# | C++ | Unity Engine | Python | JavaScript | jQuery | CSS | HTML | Blender | Motive | ParaView

2016-2018 | Undergraduate Research Assistant — University of Minnesota – Minneapolis, MN

- Proposed a set of design guidelines for 3D printing a field of glyphs on top of a data-driven surface
- Built a toolkit of Python scripts for generating 3D-printed data visualizations

Blender | Python | MeshLab | 3D Printing

Spring 2017 | Undergraduate Research Assistant — University of Auckland – Auckland, NZ

- Developed a series of scripts to automate the process of capturing 3D models from photographs
- Worked with a large existing code base

C++ | C# | Python

Publications

2020 **B. Herman**, F. Samsel, A. Bares, S. Johnson, G. Abram, and D. F. Keefe, "Printmaking, puzzles, and studio closets: Using artistic metaphors to reimagine the user interface for designing immersive visualizations," in *IEEE Transactions on Visualization and Computer Graphics*, IEEE, 2020

C. Weissman, **B. Herman**, S. Zeller, F. Samsel, and D. F. Keefe, "Automatic generation of data legends for multi-variate artist driven visualizations." IEEE SciVis Posters, 2020. SciVis Best Poster Award

D. F. Keefe, **B. Herman**, J. W. Nam, D. Orban, and S. Johnson. Book chapter in "Making Data: The creative practice of materialising digital information". Expected publication mid to late 2020.

2019 S. Johnson, F. Samsel, G. Abram, D. Olson, A. J. Solis, **B. Herman**, P. J. Wolfram, C. Lenglet, and D. F. Keefe, "Artifact-based rendering: Harnessing natural and traditional visual media for more expressive and engaging 3d visualizations," *IEEE Transactions on Visualization and Computer Graphics*, vol. 11, no. 1, pp. 492–502, 2019

2018 **B. Herman** and D. F. Keefe, "Boxcars on potatoes: Exploring the design language for tangible visualizations of scalar data fields on 3d surfaces." Toward a Design Language for Data Physicalization: Workshop at IEEE VIS 2018, 2018

Conference Presentations

2020 Presenting author, "Printmaking, Puzzles, and Studio Closets: Using artistic metaphors to reimagine the user interface for designing immersive visualizations." at IEEE VIS Arts Program 2020. Salt Lake City, Utah, virtual.

2018 Presenting author, "Boxcars on potatoes: Exploring the design language for tangible visualizations of scalar data fields on 3d surfaces." Lightning talk at workshop "Toward a Design Language for Data Physicalization," IEEE VIS 2018. Berlin, Germany.

Professional Experience

Summer 2018 | **Software Development Intern** — **Bitwise IO, Inc.** – Minneapolis, MN

- Developed a blockchain consensus algorithm in Rust based on prior academic work
- Made contributions to open-source projects Hyperledger Sawtooth and Sawtooth PBFT Consensus

Rust | Protobuf | Git | Docker | AWS | Blockchain | Consensus Algorithms

University Service

2020 - Present Lab Ambassador

Volunteering

2019-Present | **Fleet Manager** — **Minnesota Brass, Inc.** – St. Paul, MN

- Managed a pool of drivers to ensure that equipment trailers got to their destinations each weekend
- Recruited and taught new truck drivers the basics of driving a rig

2018-Present | **Percussion Instructor** — **Minnesota Brass, Inc.** – St. Paul, MN

- Led music and performance rehearsals for small groups of students
- Designed and set up a new speaker and microphone arrangement

Professional Affiliations

Student Member, Association for Computing Machinery (ACM)