Seth Alan Johnson

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Summary of Qualifications

- Designed and developed several virtual reality applications with C++, OpenGL, and Unity
- Collaborated with multiple interdisciplinary teams to perform scientific visualization research
- Directed, produced, and edited videos to showcase virtual reality experiences
- Trained, mentored, and tutored students of all levels in math, science, and programming

Education

Doctor of Philosophy, Computer Science
University of Minnesota – Twin Cities, Minneapolis, MN — Expected: 05/2020

- Research Focus**:** Virtual Reality, 3D User Interfaces, and Interactive Data Visualization
- Dissertation Title**:** *Palpable Visualizations: Techniques for Creatively Designing Discernible and Engaging Visualizations Grounded in the Physical World*

Master of Science, Computer Science
University of Minnesota – Twin Cities, Minneapolis, MN — 01/2017

Bachelor of Science, Computer Science
University of Minnesota – Twin Cities, Minneapolis, MN — 05/2014

Research Experience

Interactive Visualization Lab - University of Minnesota – Twin Cities, Minneapolis, MN
Graduate Research Assistant — 09/2014 - Present

- Research AR/VR rendering and user interface techniques for 3D data visualization
- Assess needs, extract information, and prioritize requirements through interdisciplinary meetings
- Develop computer software tools to support 3D visualization research tasks in many scientific fields
- Produce and direct videos spotlighting immersive VR lab research projects for publications
- Facilitate regular virtual reality lab demos and tours for visiting faculty and school groups
- Train and mentor undergraduate and graduate students in a research lab environment

Skills

Programming Languages: C/C++, C#, Python, GLSL, HLSL/Cg, Processing

Development Tools: Unity, OpenGL, Git, GitHub, Visual Studio, Xcode, Make, CMake, VTK

Software: Paraview, Photoshop, After Effects, Premiere Pro, DaVinci Resolve, Blender, Microsoft Office

OS, VR Platforms: Windows, Mac OSX, Linux, HTC Vive, Magic Leap, Oculus Rift/Quest, Magic Leap

Teaching Experience

University of Minnesota – Twin Cities, Minneapolis, MN
Graduate Teaching Assistant — 09/2014 - 12/2017

- Supported teaching for intro to visualization and software design & development courses
- Developed new student projects for junior-level software design classes
- Lead class discussions and labs for 100+ students per semester
- Established grading rubrics for diverse array of writing and programming assignments

Industry Experience

Samsung Research, San Jose, CA
Research Intern 05/2017 - 08/2017

- Researched new low-level GPU profiling techniques for third-party mobile graphics applications
- Assessed inconclusive research of three previous interns before implementing first successful prototype
- Designed and tested workflows for memory tracing mobile apps by modifying existing simulators

Amazon, Seattle, WA
Software Development Engineer Intern 05/2014 - 08/2014

- Researched high-performance loading algorithms for digital comic book content
- Evaluated and presented alternative approaches when recommended methods proved insufficient
- Utilized industry-level version control and testing for graphical end-user software

AppFirst, Bloomington, MN
Software Development Engineer Intern 05/2012 - 08/2012

- Created and maintained automated testing infrastructure for cross-platform software
- Configured Windows Server and Linux virtual machines
- Tested and debugged product written in C
- Developed product API packages in a Git-based team environment using Python and C#

Publications and Presentations

Journal Publications

- **S. Johnson,** F. Samsel, G. Abram, D. Olson, A. J. Solis, B. Herman, P. J. Wolfram, C. Lenglet, D F. Keefe. *Artifact-Based Rendering: Harnessing Natural and Traditional Visual Media for More Expressive and Engaging 3D Visualizations.* Transactions on Visualization and Computer Graphics, 2019.
- **S. Johnson**, D. Orban, H. B. Runesha, L. Meng, B. Juhnke, A. Erdman, F. Samsel and D. F. Keefe. *Bento Box: An Interactive and Zoomable Small Multiples Technique for Visualizing 4D Simulation Ensembles in Virtual Reality.* Frontiers in Robotics and AI, 2019; Vol. 6, Page 61: 2296-9144.
- D. Keefe, **S. Johnson**, R. Altheimer, D. Hong, R. Hunter, A. J. Johnson, M. Rockcastle, M. Swackhammer, A. Wittkamper. *Weather Report: A Site-Specific Artwork Interweaving Human Experiences and Scientific Data Physicalization*. IEEE Computer Graphics and Applications, 2018; Volume: 38, Issue: 4, Pages 10 – 16: 0272-1716.
- **S. Johnson**, B. Jackson, B. Tourek, M. Molina, A. G. Erdman, and D. F. Keefe. Immersive Analytics for Medicine: Hybrid 2D/3D Sketch-Based Interfaces for Annotating Medical Data and Designing Medical Devices. Proceedings of the 2016 ACM Companion on Interactive Surfaces and Spaces, 2016; Pages 107--113: 2296-9144.

Posters

- D. Orban, **S. Johnson,** H. B. Runesha,, L. Meng, B. Juhnke, A. Erdman, F. Samsel, D. F. Keefe. *Comparison of Multiple Large Fluid-Structure Interaction Simulations in Virtual Reality.* Symposium on Large Data Analysis and Visualization, IEEE, 2018.
- A. Singal, C. L. Soule, **S. Johnson**, D. Keefe, P. A. Iaizzo. *Measurement of Biomechanical Properties of Tissues Under Uniaxial Stress*. Design of Medical Devices Conference, 2014.

Presentations

- Presented Immersive Analytics for Medicine: Hybrid 2D/3D Sketch-Based Interfaces for Annotating Medical Data and Designing Medical Devices at Immersive Analytics workshop at Interactive Surfaces and Spaces conference, Niagara Falls, ON, 2016.
- Presented summary of research at IEEE VR Doctoral Consortium in Arles, France, 2015.