

Data visualization and virtual reality researcher with 8 years of experience with

- > Creating 3D user interaction techniques for data analysis and presentation — for geospatial, medical, and cultural heritage data
- > Developing *Unity C#* applications in various levels of fidelity — from experimental research prototype to interactive installations
- > Making interactive 3D prototypes on multiple surfaces — HMD VR, CAVE VR, mobile VR, projection-based AR, large tiled displays
- > Formulating requirements on multi-disciplinary collaboration projects — working with scientists, artists, and industry partners

EDUCATION

2014-2022	Ph.D., Computer Science > Advisor: Daniel F. Keefe > Dissertation title: <i>Everyday Scientific Visualization: Making 3D Visualization Techniques Accessible for Day-To-Day Team-Science for Collaboration and Analysis</i> > Specializations: Data visualization, virtual reality, data storytelling	UNIVERSITY OF MINNESOTA – Minneapolis, MN
2012-2014	M.S., Computer Science > Specializations: Computer graphics, virtual reality	UNIVERSITY OF MINNESOTA – Minneapolis, MN
2008-2012	B.S., Computer Science > Specializations: Computer graphics, user interfaces	UNIVERSITY OF MINNESOTA – Minneapolis, MN

SKILLS

Programming Languages	C#, C++, Java, Cg/HLSL, Processing
Development Tools	Unity, OpenGL, Git, CMake, MPI, Visual Studio, Visual Studio Code, Docker
3D Tracking Systems	OptiTrack, Microsoft Kinect, Leap Motion, Vuforia, OpenCV
Display Technologies	HMD VR, CAVE VR, Mobile VR, Projection-based AR, Large Tiled Displays, 3D Printing
Software & Tools	Photoshop, Illustrator, Shotcut

RELEVANT EXPERIENCE

2022-Present	Postdoctoral Researcher > Upgrade Intel's raytracing application to facilitate immersive virtual reality experiences > Extend its core rendering engine to display a single coherent virtual environment on tiled display walls > Develop interaction techniques for gesture-based scene navigation and object manipulation > Lead a monthly meeting with software engineers at Intel to communicate prototyping decisions and discuss strategies for integrating new changes into their codebase > Collaborate with research scientists in high-performance computing to make the application run on tiled display walls driven by a cluster of nineteen Linux PCs C++ CMake MPI TCP/IP Docker Intel OSPRay Studio Microsoft Kinect Large Tiled Displays	UNIVERSITY OF TEXAS – Austin, TX
2019-2021 <small>Alternative Military Service</small>	Technical Research Personnel > Participated in cross-institutional collaboration projects that require public exhibitions every year > Collaborate with external teams to design interactive installations for history museums > Led internal meetings with designers, developers, and curators to formulate realistic plans and tasks > Developed visualization and interaction techniques for use by museum visitors to explore museums' archived data using gesture-based interaction > Facilitated regular lab tours for visiting outside collaborators and stakeholders Unity C# Microsoft Kinect Large Format Displays	GWANGJU INSTITUTE OF SCIENCE AND TECHNOLOGY – Gwangju, S. Korea
2014-2019	Research Assistant > Created 3D interactive systems to assist scientists with analyzing and presenting their data > Collaborated on 3 multi-disciplinary projects involving teams at the U.S. National Forest Services, the Center for Spirituality and Healing, and the Medical Device Center > Developed interactive AR/VR prototypes for both expert-driven and public-facing use cases > Facilitated regular virtual reality lab tours for visiting faculty and school groups Unity C# Processing R OptiTrack MS Kinect HMD VR CAVE VR Mobile VR Projection-based AR 3D Printing	UNIVERSITY OF MINNESOTA – Minneapolis, MN

Summer 2018	Research Intern > Developed frameworks for creating data stories and collaborating around exchanged stories in different device settings, e.g., in browsers, phones, and desktop settings Unity C# PHP MySQL JavaScript CSS HTML	INRIA – Saclay, France
2011-2014	Programmer > Worked with pathologists to develop a Photoshop-like JAVA application for assembling scanned tissue images into a complete organ and annotating cancer boundaries for further data analysis Java Java3D	UNIVERSITY OF MINNESOTA – Minneapolis, MN

PUBLIC EXHIBITIONS

December 2021	Developer, “The Road of Hyecho.” Interactive installation at Gwangju Cultural Foundation. S. Korea. 🔗 News Unity C# Microsoft Kinect Projection Wall
December 2020	Developer, “The Road of Ramayana.” Interactive installation at Asia Culture Center. Gwangju, S. Korea. 📺 YouTube 🔗 News 🔗 News Unity C# Microsoft Kinect Large Format Display
November 2014	Developer, “Spatial Correlation: An Interactive Display of Virtual Gesture Sculpture.” Interactive installation at IEEE VIS 2014 Arts Program. Paris, France. 📺 YouTube 🔗 Publication Processing Java GLSL Microsoft Kinect V1

PUBLICATIONS

VR/AR	<p>J. W. Nam, G. D. Abram, F. Samsel, and P. A. Navrátil, “Immersive ospray: Enabling vr experiences with ospray,” in <i>2023 ACM conference on practice and experience in advanced research computing (PEARC)</i>, 2023, (to appear)</p> <p>J. W. Nam, K. McCullough, J. Tveite, M. M. Espinosa, C. H. Perry, B. T. Wilson, and D. F. Keefe, “Worlds-in-wedges: Combining worlds-in-miniature and portals to support comparative immersive visualization of forestry data,” in <i>2019 IEEE conference on virtual reality and 3D user interfaces (VR)</i>, 2019, pp. 747–755. doi: 10.1109/VR.2019.8797871 📺 YouTube 📺 Presentation IEEE VR</p> <p>Poster - J. W. Nam, C. H. Perry, B. T. Wilson, and D. F. Keefe, “Linked view visualization using clipboard-style mobile vr: Application to communicating forestry data,” IEEE VIS Posters, 2019 📺 YouTube 🌟 SciVis Best Poster Award</p> <p>D. F. Keefe, B. Herman, J. W. Nam, D. T. Orban, and S. Johnson, “Hybrid data constructs: Interacting with biomedical data in augmented spaces,” in <i>Making Data: The Creative Practice of Materialising Digital Information</i>. London: Bloomsbury, 2022, ch. 11, pp. 169–182. doi: 10.5040/9781350133266.ch-011</p> <p>Poster - N. Park, Y. Hong, H. Park, J. W. Nam, K. Kim, J. Pyo, K. Gil, and K. Lee, “Effects of age and motivation for visiting on ar museum experiences,” ACM VRST Posters, 2019. doi: 10.1145/3359996.3364711</p>
3D UI	<p>J. W. Nam, T. Isenberg, and D. F. Keefe, “V-mail: 3d-enabled correspondence about spatial data on (almost) all your devices,” <i>IEEE Transactions on Visualization and Computer Graphics</i>, 2022, (in publication). doi: 10.1109/TVCG.2022.3229017 📺 YouTube</p> <p>J. W. Nam and D. F. Keefe, “Spatial correlation: An interactive display of virtual gesture sculpture,” <i>Leonardo</i>, vol. 50, no. 1, pp. 94–95, 2017. doi: 10.1162/LEON_a_01226 📺 YouTube</p>
Medical VIS	<p>H. Farooq, J. Xu, J. W. Nam, D. F. Keefe, E. Yacoub, T. Georgiou, and C. Lenglet, “Microstructure imaging of crossing (mix) white matter fibers from diffusion mri,” <i>Nature Scientific Reports</i>, vol. 6, no. 38927, 2016. doi: 10.1038/srep38927</p>