

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

RESEARCH 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 <div>INRIA – Saclay, France</div> <ul style="list-style-type: none"> Investigated ways of leveraging storytelling and lightweight communication for science collaboration Developed frameworks for creating data stories and collaborating around exchanged stories in different device settings, e.g., in browsers, phones, and desktop settings <div> Unity C# PHP MySQL JavaScript CSS HTML </div>
2011-2014	Programmer <div>UNIVERSITY OF MINNESOTA – Minneapolis, MN</div> <ul style="list-style-type: none"> 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 Integrated Java3D to view and interact with drawn cancer boundaries in 3D and implemented corresponding interaction functionalities <div> Java Java3D </div>

TEACHING EXPERIENCE






Spring 2018	Teaching Assistant <div>UNIVERSITY OF MINNESOTA – Minneapolis, MN</div> <div>Course: CSCI 4611 – Programming Interactive Computer Graphics and Games</div> <ul style="list-style-type: none"> Provided feedback and guidance to students on their in-class projects Graded written and programming assignments
Spring 2015	Teaching Assistant <div>UNIVERSITY OF MINNESOTA – Minneapolis, MN</div> <div>Course: CSCI 5609 Visualization</div> <ul style="list-style-type: none"> Developed new student projects for junior-level visualization class Provided feedback and guidance to students on their in-class projects Graded written and programming assignments

PUBLIC EXHIBITIONS

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

PUBLICATIONS

- 2023 **J. W. Nam**, G. D. Abram, F. Samsel, and P. A. Navrátil, “Immersive ospray: Enabling vr experiences with ospray,” in *2023 ACM conference on practice and experience in advanced research computing (PEARC)*, 2023, (to appear)
- 2022 **J. W. Nam**, T. Isenberg, and D. F. Keefe, “V-mail: 3d-enabled correspondence about spatial data on (almost) all your devices,” *IEEE Transactions on Visualization and Computer Graphics*, 2022, (in publication). doi: 10.1109/TVCG.2022.3229017
[📺 YouTube](#)
- 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 *Making Data: The Creative Practice of Materialising Digital Information*. London: Bloomsbury, 2022, ch. 11, pp. 169–182. doi: 10.5040/9781350133266.ch-011

- 2019** 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 *2019 IEEE conference on virtual reality and 3D user interfaces (VR)*, 2019, pp. 747–755. doi: 10.1109/VR.2019.8797871
 [YouTube](#)  [Presentation IEEE VR](#)
- E. Leng, J. C. Henriksen, A. E. Rizzardi, J. Jin, J. W. Nam, B. M. Brassuer, A. D. Johnson, N. P. Reder, J. S. Koopmeiners, S. C. Schmechel *et al.*, “Signature maps for automatic identification of prostate cancer from colorimetric analysis of h&e-and ihc-stained histopathological specimens,” *Nature Scientific Reports*, vol. 9, no. 6992, 2019. doi: 10.1038/s41598-019-43486-y
- 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](#)
- 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
- 2017** J. W. Nam and D. F. Keefe, “Spatial correlation: An interactive display of virtual gesture sculpture,” *Leonardo*, vol. 50, no. 1, pp. 94–95, 2017. doi: 10.1162/LEON_a_01226
 [YouTube](#)
- 2016** 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,” *Nature Scientific Reports*, vol. 6, no. 38927, 2016. doi: 10.1038/srep38927
- G. J. Metzger, C. Kalavagunta, B. Spilseth, P. J. Bolan, X. Li, D. Hutter, J. W. Nam, A. D. Johnson, J. C. Henriksen, L. Moench *et al.*, “Detection of prostate cancer: quantitative multiparametric mr imaging models developed using registered correlative histopathology,” *Radiology*, vol. 279, no. 3, pp. 805–816, 2016. doi: 10.1148/radiol.2015151089