Curriculum Vitae
E. WES BETHEL
September, 2019

Senior Computer Scientist, Data Analytics and Visualization Group Leader   http://dav.lbl.gov/~wes
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BIOGRAPHICAL SKETCH

Bethel, a Senior Scientist at Lawrence Berkeley National Laboratory, and his team conduct basic and applied research and development on techniques and tools for enabling scientific knowledge discovery in some of the world's largest collections of scientific data generated by computational models, simulations, and experiments. Since taking over as Group Leader in 2001, he has grown the program from two persons with an annual budget of about $500K to a vibrant program that has earned an internationally acclaimed reputation for excellence, and that consists of about 12 staff and an annual budget of over $4M. He conceived and was the Coordinating Principal Investigator for the SciDAC Visualization and Analytics Center for Enabling Technology (VACET) which made production-quality, petascale-capable visualization a reality at DOE supercomputing facilities, and has produced software tools in use by a worldwide scientific community in disciplines ranging from high energy physics to climate modeling. His research interests include software architecture, high performance computing, scientific and information visualization, computer graphics, computer vision, image analysis, and machine learning. He is an ACM Distinguished Scientist, and a Senior Fellow at the Berkeley Institute for Data Science (UC Berkeley).

PROFESSIONAL PREPARATION

University of California, Davis	Computer Science	Ph.D.	2010
University of Tulsa	Computer Science	M.S.	1986
University of Tulsa	Information Systems	B.S.	1983

PROFESSIONAL APPOINTMENTS

2017–present	Old Dominion University, Norfolk, VA – Adjunct Associate Professor, Computer Science
2011–present	Lawrence Berkeley National Laboratory, Berkeley, CA – Group Leader, Senior Computer Scientist
2001–2011	Lawrence Berkeley National Laboratory, Berkeley, CA – Group Leader, Computer Scientist
1990–2001	Lawrence Berkeley National Laboratory, Berkeley, CA – Computer Scientist
1997–2010	R3vis Corporation, Novato, CA – Founding Technical Director, Chief Technology Officer, Software Architect
2000–2001	University of California, Berkeley, Institute for Transportation Studies – Principal Development Engineer
1988–1989	Bethel Software – Principal
1987–1988	Island Graphics Corporation, San Rafael, CA – Software Engineer
1987	Amoco Research Center, Tulsa, OK – Consultant
1986-1987	Geoscan Inc., Tulsa, OK – Senior Graphics Engineer
1984-1986	University of Tulsa – Graduate Research Assistant

Select Recent Publications

1. Burlen Loring, Andrew Myers, David Camp, and E. Wes Bethel. Python-based in situ analysis and visualization. In *Proceedings of the Workshop on In Situ Infrastructures for Enabling Extreme-Scale Analysis and Visualization - ISAV '18*. ACM Press, 2018.

2. Utkarsh Ayachit, Andrew Bauer, Earl P. N. Duque, Greg Eisenhauer, Nicola Ferrier, Junmin Gu, Kenneth Jansen, Burlen Loring, Zarija Lukić, Suresh Menon, Dmitriy Morozov, Patrick O'Leary, Michel Rasquin, Christopher P. Stone, Venkat Vishwanath, Gunther H. Weber, Brad Whitlock, Matthew Wolf, K. John Wu, and E. Wes Bethel. Performance Analysis, Design Considerations, and Applications of

Extreme-scale *In Situ* Infrastructures. In *ACM/IEEE International Conference for High Performance Computing, Networking, Storage and Analysis (SC16)*, Salt Lake City, UT, USA, November 2016.

3. Andrew C. Bauer, Hasan Abbasi, James Ahrens, Hank Childs, Berk Geveci, Scott Klasky, Kenneth Moreland, Patrick O'Leary, Venkatram Vishwanath, Brad Whitlock, and E. Wes Bethel. *In Situ* Methods, Infrastructures, and Applications on High Performance Computing Platforms, a State-of-the-art (STAR) Report. *Computer Graphics Forum, Proceedings of Eurovis 2016*, 35(3), June 2016.

4. O. Rübel, B. Loring, J. L. Vay, D. P. Grote, R. Lehe, S. Bulanov, H. Vincenti, and E. W. Bethel. WarpIV: In Situ Visualization and Analysis of Ion Accelerator Simulations. *IEEE Computer Graphics and Applications*, 36(3):22–35, May 2016.

Select Recent Grants

1. U. S. Department of Energy, Office of Science, Office of Advanced Scientific Computing Research. "Scalable Data-Computing Convergence and Scientific Knowledge Discovery." $900K/yr FY2018–FY2020. E. Wes Bethel (PI).

2. U. S. Department of Energy, Office of Science, Office of Advanced Scientific Computing Research. "Scalable Analysis Methods and *In Situ* Infrastructure for Extreme Scale Knowledge Discovery." $1.4M/yr FY2018–FY2020. E. Wes Bethel (PI).

3. U. S. Department of Energy, Office of Science, Office of Advanced Scientific Computing Research. "A SciDAC Institute for Computer Science and Data." $6M/yr FY2018–FY2020. R. Ross (PI); E. Wes Bethel (Senior Personnel).

Synergistic Activities

- As a Senior Fellow in the Berkeley Institute for Data Science, he serves as a bridge between the academic data science research community and DOE's large-scale HPC-focused R&D efforts in the data space.
- As organizer and general chair for the SC workshop *In Situ* Infrastructures for Enabling Extreme-scale Analysis and Visualization, he fostered growth of a broad *in situ* community in the HPC space.
- As Data Analytics and Visualization sub-plexus co-lead for the DOE Office of Advanced Scientific Computing Research, he was instrumental in shaping the R&D agenda for visualization and analytics for the entire DOE-funded analytics and visualization community that will lead to algorithms and software infrastructure usable by the scientific community on future exascale-class platforms.
- As Coordinating Principal Investigator on DOE's largest-ever open-science visualization program, he was the visionary and leader for a five-institution program that made production-quality, petascale-capable visual data exploration and analysis a reality, and showed positive impact on computational science research projects.
- *De facto* chair of the DOE Computer Graphics Forum (DOECGF), an *ad hoc* organization of computer graphics and visualization professionals who receive DOE funding dating back to the 1970s. See www.doecgf.org.
- Chief architect of field-leading software applications/packages for: remote/distributed visualization, high-performance parallel scene graph-based data management and rendering, hybrid-parallel visualization for use on extreme-concurrency platforms.
- Founding technical director of R3vis Corporation. Chief software architect for commercially licensed rendering software, negotiated license agreements, overseeing ongoing operations.

Recent Instruction/Teaching

- SC18, November 2018, Dallas TX, USA. SENSEI Cross-Platform View of In Situ Analytics. E. Wes Bethel, David Thompson, Burlen Loring, Silvio Rizzi, Brad Whitlock, Matthew Worlf, Patrick O'Leary. https://sc18.supercomputing.org/presentation/?id=tut142&sess=sess255
- SC17, November 2018, Denver CO, USA. In Situ Analysis and Visualization with SENSEI. E. Wes Bethel, Andrew C. Bauer, Brad Whitlock, Matthew Wolf, Burlen Loring, Silvio Rizzi. https://sc17.supercomputing.org/index.html%3Fpost_type=page&p=5407&id=tut153&sess=sess234.html

Other Certifications: Instrument-rated private pilot with complex and high performance aircraft endorsements, FAA certificate No. 2791855; Taekwondo 4th Dan, Kukkiwon certificate No. 5905313; Yoga Alliance RYT 200 Instructor Certification No. 279633.