

James Kress

Curriculum Vitae

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Biographical Sketch

James Kress is a research scientist in the Computer Science and Mathematics Division at Oak Ridge National Laboratory. He joined ORNL in December of 2016 after receiving his Master's degree from the University of Oregon. His research interests include in situ visualization and analysis, high performance computing, and the intersection of the two. Kress is currently a PhD Candidate in computer science at the University of Oregon. Contact him at kressjm@ornl.gov.

Education

- 2013–Present **Ph.D. Candidate in Computer Science**, *University of Oregon*, Eugene, Oregon.
Expected Graduation Spring 2018; Advisor: Hank Childs
- 2013–2016 **Master of Science Computer and Information Science**, *University of Oregon*, Eugene Oregon.
- 2009–2013 **Bachelor of Science Computer Science**, *Boise State University*, Boise Idaho, *Cum Laude*.
Minor in Political Science

Peer-Reviewed Book Chapters

- [1] James Kress, Jong Choi, Scott Klasky, Michael Churchill, Hank Childs, and David Pugmire. "Binning Based Data Reduction for Vector Field Data of a Particle-In-Cell Fusion Simulation". In: *ISC High Performance 2018 International Workshops*. Vol. 11203. Lecture Notes in Computer Science. Frankfurt, Germany: Springer Publishing, June 2018, pp. 215–229.
- [2] Mark Kim, James Kress, Jong Choi, Norbert Podhorszki, Scott Klasky, Matthew Wolf, Kshitij Mehta, Kevin Huck, Berk Geveci, Sujin Phillip, et al. "In Situ Analysis and Visualization of Fusion Simulations: Lessons Learned". In: *ISC High Performance 2018 International Workshops*. Vol. 11203. Lecture Notes in Computer Science. Frankfurt, Germany: Springer Publishing, June 2018, pp. 230–242.

Peer-Reviewed Journal Publications

- [3] Kenneth Moreland, Christopher Sewell, William Usher, Li-ta Lo, Jeremy Meredith, David Pugmire, James Kress, Hendrik Schroots, Kwan-Liu Ma, Hank Childs, et al. "Vtk-m: Accelerating the visualization toolkit for massively threaded architectures". In: *IEEE computer graphics and applications* 36.3 (2016), pp. 48–58.
- [4] James Kress, Randy Michael Churchill, Scott Klasky, Mark Kim, Hank Childs, and David Pugmire. "Preparing for in situ processing on upcoming leading-edge supercomputers". In: *Supercomputing frontiers and innovations* 3.4 (2016).

Peer-Reviewed Conference and Symposium Proceedings

- [5] Jong Youl Choi, Choong-Seock Chang, Julien Dominski, Scott Klasky, Gabriele Merlo, Eric Suchyta, Mark Ainsworth, Bryce Allen, Franck Cappello, Michael Churchill, et al. "Coupling Exascale Multiphysics Applications: Methods and Lessons Learned". In: *2018 IEEE 14th International Conference on e-Science (e-Science)*. IEEE. 2018, pp. 442–452.
- [6] David Pugmire, Abhishek Yenpure, Mark Kim, James Kress, Robert Maynard, Hank Childs, and Bernd Hentschel. "Performance-Portable Particle Advection with VTK-m." In: *EGPGV*. 2018, pp. 45–55.
- [7] Scott Klasky, Matthew Wolf, Mark Ainsworth, Chuck Atkins, Jong Choi, Greg Eisenhauer, Berk Geveci, William Godoy, Mark Kim, James Kress, et al. "A View from ORNL: Scientific Data Research Opportunities in the Big Data Age". In: *2018 IEEE 38th International Conference on Distributed Computing Systems (ICDCS)*. IEEE. 2018, pp. 1357–1368.
- [8] Matthew Larsen, Cyrus Harrison, James Kress, David Pugmire, Jeremy S Meredith, and Hank Childs. "Performance modeling of in situ rendering". In: *SC'16: Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*. IEEE. 2016, pp. 276–287.
- [9] Jong Youl Choi, Tahsin Kurc, Jeremy Logan, Matthew Wolf, Eric Suchyta, James Kress, David Pugmire, Norbert Podhorszki, Eun-Kyu Byun, Mark Ainsworth, et al. "Stream processing for near real-time scientific data analysis". In: *2016 New York Scientific Data Summit (NYS DS)*. IEEE. 2016, pp. 1–8.
- [10] James Kress, Erik Anderson, and Hank Childs. "A visualization pipeline for large-scale tractography data". In: *2015 IEEE 5th Symposium on Large Data Analysis and Visualization (LDAV)*. IEEE. 2015, pp. 115–123.

- [11] James Kress, Songhua Xu, and Georgia Tourassi. "A novel graphical user interface for high-efficacy modeling of human perceptual similarity opinions". In: *Medical Imaging 2013: Image Perception, Observer Performance, and Technology Assessment*. Vol. 8673. International Society for Optics and Photonics. 2013, p. 867306.

Peer-Reviewed Workshop Proceedings

- [12] James Kress, David Pugmire, Scott Klasky, and Hank Childs. "Visualization and analysis requirements for in situ processing for a large-scale fusion simulation code". In: *Proceedings of the 2nd Workshop on In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization*. IEEE Press. 2016, pp. 45–50.
- [13] David Pugmire, James Kress, Jong Choi, Scott Klasky, Tahsin Kurc, Randy Michael Churchill, Matthew Wolf, Greg Eisenhower, Hank Childs, Kesheng Wu, et al. "Visualization and analysis for near-real-time decision making in distributed workflows". In: *2016 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*. IEEE. 2016, pp. 1007–1013.
- [14] James Kress, Scott Klasky, Norbert Podhorszki, Jong Choi, Hank Childs, and David Pugmire. "Loosely coupled in situ visualization: A perspective on why it's here to stay". In: *Proceedings of the First Workshop on In Situ Infrastructures for Enabling Extreme-Scale Analysis and Visualization*. ACM. 2015, pp. 1–6.
- [15] David Pugmire, James Kress, Jeremy Meredith, Norbert Podhorszki, Jong Choi, and Scott Klasky. "Towards scalable visualization plugins for data staging workflows". In: *Big Data Analytics: Challenges and Opportunities (BDAC-14) Workshop at Supercomputing Conference*. 2014.

Computer skills

Advanced	JAVA, C, BASH, L ^A T _E X, EAVL, Linux, Microsoft Windows
Intermediate	C++, C#, OBJECTIVE C, ADIOS, MYSQL, KML, OPENMP, MPI, iOS, VTK, VTK-M
Basic	DATASPACES, VISIT, HTML, R, CILK PLUS, TBB

Employment

Technical Employment

- 12/16–Present **Research Scientist in Scientific Visualization**, OAK RIDGE NATIONAL LABORATORY, Oak Ridge, Tennessee.
- 6/16–9/16 **Research Intern - ASTRO**, OAK RIDGE NATIONAL LABORATORY, Oak Ridge, Tennessee.
Continuing usability studies and research on in situ visualization workflows for SciDAC simulation codes using ADIOS, EAVL, and VTK-m. Mentor: David Pugmire
- 6/15–9/15 **Research Intern - ASTRO**, OAK RIDGE NATIONAL LABORATORY, Oak Ridge, Tennessee.
Conducted usability studies and research on in situ visualization workflows for SciDAC simulation codes. Studies utilized ADIOS and EAVL while also requiring EAVL development. Mentor: David Pugmire
- 2/13–8/15 **Software Contractor**, LEE PESKY LEARNING CENTER, Boise, Idaho.
Designed and implemented two iOS applications, later ported to android, to aid in early childhood learning. The first was targeted towards teachers who need easy access to quick activities in the classroom. The second was a multilingual app targeted towards parents and provided at-you-fingertips teaching opportunities for parents.
- 6/14–9/14 **Research Intern - HERE**, OAK RIDGE NATIONAL LABORATORY, Oak Ridge, Tennessee.
My work focused on using EAVL (the Extreme-scale Analysis and Visualization Library) and ADIOS (the Adaptable IO System) in conjunction with the XGC physics simulation code to create a scalable in-situ analysis and visualization solution of tokamak particle movement. Mentor: David Pugmire
- 6/13–8/13 **Research Intern - SULI**, OAK RIDGE NATIONAL LABORATORY, Oak Ridge, Tennessee.
Designed a visual interface for large scale environmental pollutant data in the United States. Mentor: Georgia Tourassi
- 6/12–8/12 **Research Intern - SULI**, OAK RIDGE NATIONAL LABORATORY, Oak Ridge, Tennessee.
Created and implemented a novel graphical user interface for high-efficacy modeling of human perceptual opinions. In conjunction, I developed and implemented a statistical modeling process to analyze the data that was collected with the new user interface compared to current collection methods. Mentor: Georgia Tourassi

Other Employment

- 8/12–5/13 **Lab Assistant**, DEPARTMENT OF COMPUTER SCIENCE, Boise State University, Boise, Idaho.
Assisted students in the Linux Lab who were having trouble with either their operating system or assignment and gave them direction on how to proceed.
- 12/09–2/13 **Trip Leader**, OUTDOOR PROGRAM, Boise State University, Boise, Idaho.
Organized and lead student trips into the outdoors, including creating trip itinerary, menus, risk management, and experiential education programs.

Service

- 2017 Reviewer, EuroVis
- 2015 Early Career Program Committee, In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization
- 2013-2015 Member, University of Oregon Graduate School Student Advisory Board
- 2014-2015 President, University of Oregon Graduate Student Association
- 2013-2014 Vice President, University of Oregon Graduate Student Association
- 2014-2015 Student Member, University of Oregon Tuition and Fee Advisory Board
- 2012&2013 Volunteer, Boise Code Camp