Cameron Christensen

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SUMMARY

- Ray tracing and interactive graphics are my greatest interests, as well as virtual and augmented (XR) reality
- My strengths include dedication to high-quality work and robust, thorough, maintainable implementations
- Working cooperatively and closely with others for common goals is one of my driving motivators

EDUCATION

The University of Utah, *Salt Lake City, Utah* GRE: 165 quant (90th pct), 169 verbal (99th pct) **GPA: 3.82**
M.S.: Computing: Graphics and Visualization **Advisor:** Dr. Valerio Pascucci July 2019

- **M.S. Thesis:** *Framework and Model for Interactive Spatiotemporal Data Analysis and Visualization Systems*

The University of Utah, *Salt Lake City, Utah* Undergrad S.A.C. 1998, 1999 (Chair) **GPA: 3.52**
B.S.: Computer Science **Advisor:** Dr. Charles Hansen May 1999

- **B.S. Thesis:** *Parallel Image Composition using Shared-Memory Multicomputer*

SKILLS

Languages: *C++, Python, JavaScript, Rust, C#*
Operation Systems: *macOS, Windows, Linux*
Tools: *shell scripting, git, cmake, …*
Deployment: *Docker, Anaconda, AWS*
UI: *Custom 3d interactive widgets, React, command line*
Graphics: *Ray tracing, volume visualization, OpenGL, WebGL, three.js, DirectX, Vulkan (learning)*
Optimization: *Python/C++bindings, data transmission*
Writing: *LaTeX/Overleaf, MS Word, Apple Pages, Google Docs, Doxygen, Markdown, MkDocs*

RELEVANT EXPERIENCE

Software Developer | University of Utah Scientific Computing and Imaging Institute, *Salt Lake City* Feb 2010 - Present

- Building applications using state-of-the-art tools in order to enable research collaborations with numerous disciplines, including neuroscience, climatology, orthopedics, cardiology, and chemical engineering
- Developing cross-platform libraries using numerous languages including C++, Python, JavaScript, Apache Spark, Hadoop, CUDA, and OpenGL in order to facilitate multi-modal processing, organization, visualization, and exploration of arbitrarily large, multivariate scientific datasets
- Guiding junior developers through demonstration, positive reinforcement, and constructive feedback to help them advance with confidence, proficiency, and independence
- Writing and creating figures using word processors and LaTeX for numerous grant proposals and research papers
- Presentation of both independent and collaborative research at various conferences and seminars

Development Technology Engineer (M.S. Internship) | NVIDIA Corporation, *Santa Clara, CA* Jul 2016 - Oct 2016

- Created a library for interactive image composition using the NVLink architecture with both 4- and 8-GPU configurations in order to more efficiently visualize large datasets

High Performance Computing Research Intern | Argonne National Laboratory, *Chicago, IL* Jun 2015 - Aug 2015

- Constructed data analysis frameworks for cloud computing using Apache Spark and Hadoop to compare their data processing capability on high-performance visualization clusters, atypical platforms for them to be used

Software Development Intern | Lawrence Livermore National Laboratory, *Pleasanton, CA* May 2014 - Aug 2014

- Integrated the Extreme-scale Analysis and Visualization Library (EAVL) with the VisIt distributed parallel visualization application for use in the dynamic assessment of large-scale supercomputing simulations

Senior Software Developer | Broadcast International, *Salt Lake City, UT* Jun 2008 - Jan 2009

- Developed APIs and backend tools using the IBM Cell Broadband Engine architecture for real-time video compression used in Broadcast and IPTV applications

Senior Software Developer | Sorenson Media, *Salt Lake City, UT* Oct 2007 - Jun 2008

- Improved the backend libraries of Sorenson Squeeze by streamlining the API, improving developer documentation, and adding rigorous automated testing in order to ease the hassle of video compression for a wide variety of users

Software Development Manager | S2, Inc., *Salt Lake City, UT* Nov 2006 - Oct 2007

- Facilitated interactive exploration of lidar model acquisitions using point-based rendering for a research collaboration
- Created a web application using Adobe Flash to provide interactive high-resolution 3d product exploration

Software Engineer | Microsoft Games, *Salt Lake City, UT* Aug 2001 - Nov 2006

- Tuned gameplay mechanics with feedback from live users in order to provide the most natural feeling controls
- Engineered a unit testing framework using the established automation libraries of the time in order to robustly ensure stability throughout the development of Amped Snowboarding, Links Golf, Top Spin Tennis, and their sequels

Software Engineer | Parametric Technology Corporation, *Salt Lake City, UT* Aug 1999 – Aug 2001

- Added interfaces for the creation and modification of smooth curves and spline-based surfaces using custom 3d manipulation widgets and the Qt interface library for the company's Pro/Engineer CAD system

SELECTED PUBLICATIONS

***Embedded Domain-specific Language and Runtime System for Progressive Spatiotemporal Data Analysis and Visualization*, C. Christensen**, S. Liu, G. Scorzelli, J. Lee, P-T. Bremer, and V. Pascucci, in IEEE 6th Symposium on Large Data Analysis and Visualization 2016

- Enabled creation of simple scripts for exploration of arbitrarily large, multiresolution spatiotemporal datasets
- Facilitated interactive, incremental parallel execution of these scripts by providing an associated runtime system

***Efficient I/O and Storage of Adaptive-resolution Data*,** S. Kumar, J. Edwards, P-T. Bremer, A. Knoll, **C. Christensen**, V. Vishwanath, P. Carns, J. Schmidt, and V. Pascucci, in SC14: Intl. Conference for High Performance Computing, Networking, Storage and Analysis 2014

- Provided an adaptive format enabling storage and access to massive spatiotemporal datasets
- Enabled fast access through algorithms designed to efficiently align data with memory boundaries

***Parallelization of Diagnostics for Climate Model Development*,** J. McEnerney, S. Ames, **C. Christensen**, C. Doutriaux, T. Hoang, J. Painter, B. Smith, Z. Shaheen, and D. Williams, in Journal of Software Engineering and Applications 2016

- Added parallel computation of climate model analysis to the UV-CDAT application suite

***A Benchmarking Study to Evaluate Apache Spark on Large-Scale Supercomputers*,** George K. Thiruvathukal, **Cameron Christensen**, Xiaoyong Jin, Francois Tessier, Venkatram Vishwanath, in arXiv:1904.11812v2 [cs.DC] 2019

- Created testing applications using both Apache Spark and Hadoop in order to objectively evaluate their performance for distributed data processing when deployed on medium- to large-scale shared-memory multicomputers