THOMAS J. MARRINAN, PHD

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SUMMARY

Computational Scientist – I live at the intersection of Human-Centered and High Performance Computing, with interests in computer-supported cooperative work, human-computer interaction, visualization, and virtual reality. I believe in inspiring the next generation of computer scientists through hands-on learning and a flexible teaching style tailored to individual classrooms. My research focuses on enhancing frameworks to better enable scientific analysis of large-scale data.

EDUCATION

University of Illinois at Chicago (UIC), Chicago, IL **2010 – 2016**

Doctor of Philosophy – Computer Science

- Dissertation: "*Data-Intensive Remote Collaboration using Scalable Visualizations in Heterogeneous Display Spaces*" advised by Prof. Andrew E. Johnson

GPA – 3.91 / 4.00

Drake University, Des Moines, IA **2006 – 2010**

Bachelor of Science – Computer Science

Bachelor of Arts – Graphic Design

GPA – 3.76 / 4.00

TEACHING EXPERIENCE

Argonne National Laboratory, Postdoctoral Appointee **2015 – current**

- Collaborated with a team of computer scientists and educational professionals to create curriculum for a weeklong coding boot camp for high-school students to learn introductory Python programming
- Gave lectures to 26 high-school students and provided one-on-one assistance to students who had questions or required extra assistance during the coding boot camp
- Mentored 2 undergraduate students during summer internships

UIC, Teaching Assistant **2011 – 2012**

- Improved prior curriculum by implementing project templates to provide clearer instructions and enable students to successfully learn course concepts
- Evaluated student written code and provided one-on-one assistance during office hours
- Prepared lessons and gave lectures to 20-30 upper-level undergraduate and first-year graduate students
- Assisted professors teaching courses in computer graphics and compiler construction

UIC, Course Grader **2010**

- Evaluated undergraduate student homework assignments and course examinations

RESEARCH EXPERIENCE

Argonne National Laboratory, Postdoctoral Appointee **2015 – current**

- Developed flexible in-transit analysis code and computational steering methods to enable interactive supercomputing
- Researched using multiple display technologies in conjunction with one another to enhance scientific discovery and data dissemination
- Organized advanced visualization demonstrations for the 2016 Open House, preparing material ahead of time and giving presentations during the Open House to groups of 50-100 at a time

Electronic Visualization Laboratory (UIC), Research Assistant **2011 – 2015**

- Developed SAGE2™, a democratic multi-user windowing environment for displaying and interacting with content on large ultra high-resolution displays
- Conducted a user study involving 44 volunteers to compare three data synchronization techniques for group-to-group remote collaboration

- Collaborated with a team of bioengineers to developed high-performance computing and visualization applications suited for simulating and analyzing blood flow in the human cerebral vascular system
- Led demonstrations and laboratory tours for CS Open Houses, Chicago Ideas Week, prospective collaborators, and high school and middle school student groups

Accenture, Research Intern **2011**

- Collaborated with a research team to identify and prevent SQL database deadlock
- Developed a database resource identifier to convert SQL transactions into Petri Net models

Drake University, Research Assistant **2009 – 2010**

- Developed a multi-dimensional data visualization tool that led to more efficient identification of chromatography systems used for modifying the selectivity of the separation in complex chemical mixtures
- Developed a tool for volumetric visualization of data from the Hubble Space Telescope in order to help astronomers understand the kinematics of ionized gas in the nuclear regions of Seyfert galaxies
- Presented weekly updates in front of a group of Professors and other Research Assistants

PUBLICATIONS

Conference Proceedings

- T. Marrinan, L. Renambot, J. Leigh, A. Forbes, S. Jones, and A. Johnson. Mixed Presence Collaboration using Scalable Visualizations in Heterogeneous Display Spaces. In *Proceedings of the 2017 ACM Conference on Computer-Supported Cooperative Work and Social Computing* (CSCW). 2017, pp. 2236-2245.
- T. Marrinan, A. Nishimoto, J. Insley, S. Rizzi, A. Johnson, and M. Papka. Interactive Multi-Modal Display Spaces for Visual Analysis. In *Proceedings of the 2016 ACM International Conference on Interactive Surfaces and Spaces* (ISS). 2016, pp. 421-426.
- T. Marrinan, L. Renambot, J. Leigh, A. Forbes, S. Jones, and A. Johnson. Synchronized Mixed Presence Data-Conferencing Using Large-Scale Shared Displays. In *Proceedings of the 2016 ACM International Conference on Interactive Surfaces and Spaces* (ISS). 2016, pp. 355-360.
- T. Marrinan, J. Aurisano, A. Nishimoto, K. Bharadwaj, V. Mateevitsi, L. Renambot, L. Long, A. Johnson, and J. Leigh. SAGE2: A New Approach for Data Intensive Collaboration Using Scalable Resolution Shared Displays. In *Proceedings of the IEEE International Conference on Collaborative Computing: Networking, Applications and Worksharing* (CollaborateCom). 2014, pp. 177-186.
- T. Marrinan and A. Linninger. In *Food, Pharmaceutical and Bioengineering Division 2013 - Core Programming Area at the 2013 AIChE Annual Meeting: Global Challenges for Engineering a Sustainable Future* (AIChE). 2013, pp. 706-708.
- T. Urness, T. Marrinan, A. Johnson, and M. Vitha. Multivariate Visualization of Chromatographic Systems. In *Proceedings of SPIE-IS&T Electronic Imaging*. 2011, vol. 7868.

Journal Articles

- L. Renambot, T. Marrinan, J. Aurisano, A. Nishimoto, V. Mateevitsi, K. Bharadwaj, L. Long, A. Johnson, M. Brown, and J. Leigh. SAGE2: A Collaboration Portal for Scalable Resolution Displays. In *Future Generation Computer Systems*. 2016, vol. 54, pp. 296-305.
- A. Linninger, I. Gould, T. Marrinan, C. Hsu, M. Chojecki, and A. Alaraj. Cerebral Microcirculation and Oxygen Tension in the Human Secondary Cortex. In *Annals of Biomedical Engineering*. 2013, vol. 41, no. 11, pp. 2264-2284.
- I. Gould, T. Marrinan, M. Chojecki, M. Qader, B. Henry, M. Pervais, N. Vaicaitis, Y. Zhu, A. Rogers, and A. Linninger. Hemodynamics of Cerebral Micro Vasculature. In *Computer Aided Chemical Engineering*. 2012, vol. 31, pp. 1727-1731.
- T. Marrinan, T. Urness, C. Nelson, K. Kreimeyer, and J. Mirocha. Understanding and Interpreting Multivalued Astronomical Data. In *IEEE Computer Graphics and Applications*. 2010, vol. 30, no. 5, pp. 12-17.
- A. Johnson, M. Vitha, T. Urness, and T. Marrinan. System Selectivity Cube: A 3D Visualization Tool for Comparing the Selectivity of Gas Chromatography, Supercritical-Fluid Chromatography, High-Pressure Liquid Chromatography, and Micellar Electrokinetic Capillary Chromatography Systems. In *Analytical Chemistry*. 2010, vol. 82, no. 14, pp. 6251-6258.

Poster Presentations

- T. Marrinan, J. Insley, S. Rizzi, and M. Papka. Networking Simulation Clusters with Visualization Clusters for Real-Time Data Analysis. At *Argonne National Laboratory Postdoctoral Research and Career Symposium*. 2016.

- T. Marrinan and M. Papka. Future Outlooks for Enabling Interactive Supercomputing Frameworks. At *Greater Chicago Area Systems Research* (GCASR). 2016.
- T. Marrinan, I. Gould, C. Hsu, and A. Linninger. Whole-Brain Vascular Reconstruction, Simulation, and Visualization. At *IEEE Scientific Visualization Conference* (VisWeek). 2012.

Thesis

- T. Marrinan. Data-Intensive Remote Collaboration using Scalable Visualizations in Heterogeneous Display Spaces. *PhD Thesis, University of Illinois at Chicago*. 2016.

HONORS AND AWARDS

Best Paper – CollaborateCom **2014**

- SAGE2: A New Approach for Data Intensive Collaboration Using Scalable Resolution Shared Displays
  IEEE International Conference on Collaborative Computing: Networking, Applications and Worksharing

Cover – Physics Today **2013**

- My research on visualizing the human cerebral vascular system in the CAVE2™ Hybrid Reality System and I are depicted on the cover of the July 2013 issue of the *Physics Today* journal

NSF Highlighted Project **2013**

- NSF named my research as one of its twelve highlighted projects for the year in its *Budget Request to Congress* with a short description about how our "State-of-the-Art Virtual Reality System is the Key to Medical Discovery"

Best Poster Honorable Mention – VisWeek **2012**

- Whole-Brain Vascular Reconstruction, Simulation, and Visualization
  IEEE Scientific Visualization Conference

1st Place – UIC: the Images of Research **2012**

- Artificially Created Cortical Functional Blood Unit
  UIC annual interdisciplinary exhibit competition that showcases the breadth and diversity of research

Outstanding Student in Computer Science – Drake University **2010**

- Annual award given to the most outstanding computer science student
  Drake University College of Arts and Sciences Awards Ceremony

Outstanding Chapter President – Drake University **2010**

- Annual award given to the most outstanding chapter president of a fraternity or sorority
  Drake University Greek Gala Awards

PROFESSIONAL ACTIVITIES

Outreach

- Created introductory programming curriculum and taught 26 high-school students Python during a weeklong coding boot camp at Argonne National Laboratory
- Served as a mentor for Argonne National Laboratory's Introduce a Girl to Engineering Day, where 8th grade girls spent the day learning about the STEM careers
- Led visualization laboratory tours for Open Houses at both the Electronic Visualization Laboratory (UIC) and Argonne National Laboratory

Conferences Attended

- Computer-Supported Cooperative Work & Social Computing (CSCW). Upcoming 2017.
- Interactive Surfaces and Spaces (ISS). Upcoming 2016.
- Greater Chicago Area Systems Research (GCASR). 2016.
- High Performance Computing, Networking, Storage, and Analysis (SC). 2014, 2015.
- VisWeek / Vis. 2012, 2015.
- Collaborative Computing: Networking, Applications and Worksharing (CollaborateCom). 2014.

Grant Writing Experience

- NIH R21 (not funded). Stereoscopic 4D Modeling and Interactive Virtual Exploration of Cerebral Vasculature. Impact/Priority Score: 28, Percentile: top 19%, Funding Rate: top 14%.

Technical Skills

Programming Languages

- C
- C++
- Python
- Java
- HTML
- CSS
- JavaScript

Parallel Programming Models

- MPI
- Pthreads

Image / Video Generation and Editing

- Adobe Creative Suite
- ImageMagick
- FFmpeg
- iMovie
- Final Cut Pro
- Blender

Professional Memberships

ACM – Association for Computing Machinery
NPA – National Postdoctoral Association

Extracurricular Activities

Volunteer Work

- A Night Out – supervised events for domestic violence victims and their children
- Huntsman Cancer Institute – organized and participated in fundraising activities
- Children's Miracle Network – organized and participated in fundraising activities

Recreational Sports

- Flag Football
- Beach Volleyball
- SCUBA Diving