Chihua Ma

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EDUCATION

University of Illinois at Chicago Chicago, IL

Ph.D. in Computer Science Department and Electronic Visualization Laboratory (**EVL**) Aug 2011 – Present

Research in visualization for dynamic, multi-scale and multi-run biological networks with multivariate features. Created novel visual analytics approaches and web-based visualization tools using JavaScript (D3.js and Three.js) and Processing to explore and compare multiple dynamic biological networks and summarize their similarities and differences at multiple levels.

Cumulative GPA: 3.7

M.S. in Electrical and Computer Engineering Aug 2009 – May 2011

Thesis not required, but worked on a research project to develop a caretaker robot for the elderly. Developed a program using Matlab to detect human fingers and directions of the fingers.

Nankai University Tianjin, China

B.S. in Computer Science and Technology Sep 2005 – June 2009

EXPERIENCE

University of Illinois at Chicago May 2011 - Present

Research Assistant, EVL May 2015 – Aug 2015, Jan 2016 – Present

- **Visualization of Ensemble Dynamic Brain Networks**. Collaborating with neuroscientists to create a web-based visual analytics tool using JavaScript (D3.js) to explore and compare multiple dynamic brain activity networks with multivariate features. Completed data processing and analysis of brain imaging data using C++, Python and R.
- **Visualization of Cancer Therapy Analysis**. Collaborating with domain experts to implement a web-based visual therapy explorer using JavaScript (D3.js) that enables the systematic similarity-based exploration and analysis of individual factors in the patient repository to guide precision therapy.
- **Visualizing Ensemble Probability Landscapes of Stochastic Networks**. Developed a web-based visualization with a 3D view using JavaScript (D3.js and Three.js) to explore and compare probability spatio-temporal landscapes from multiple simulations in collaboration with bioinformaticians.
- **Visualization of Probability Landscapes of Stochastic Networks.** Implemented a web-based visual approach using JavaScript (D3.js) to explore probability distributions in both time and state space of the stochastic gene regulatory networks in collaboration with bioinformaticians.
- Mentored Research Experiences for Undergraduates (REU) students in the summer of 2016 & 2017

Teaching Assistant, Computer Science Department Aug 2012 – Dec 2015

- Responsible for leading discussion sessions, labs, consulting with students, and grading, for courses:
  CS 141 Programming Design II (Fall 2015)
  CS 151 Mathematical Foundations of Computing (Spring 2013)
  CS 342 Software Design (Spring 2014, Fall 2014, Spring 2015)
  CS 488 Computer Graphics I (Fall 2012, Fall 2013, Fall 2015)

Graduate Assistant, Office of Social Science Research May 2011 – Aug 2012

- Designed and maintained the websites using HTML, CSS and Dreamweaver
- Assisted faculties in troubleshooting technical issues with their lab computers

CME Group Chicago, IL

Software Engineering Intern, Technology & Enterprise Computing Division May 2013 – Dec 2013

- Developed an interactive multi-view visualization tool using Processing & Java to explore the effects of GC on latency and variability in financial trades with an exchange

China Central Television (CCTV) Beijing, China

Assistant Director Intern, "NEWS PROBE" Feb 2009 – May 2009

- Assisted the director in materials collection, video recording and editing

HONORS & AWARDS

- 2017 IS&T 2017 Charles E. Ives Journal Award for Best Paper in Journal of Imaging Science and Technology.
- 2016 IEEE VGTC Visualization Pioneers Group (VPG) Data Visualization Contest Honorable Mention.
- 2016 IEEE VIS 2016 Doctoral Colloquium Participant - selected by a committee and had travel & registration paid.
- 2016 UIC Student Presenter Award to assist w/ travel expense to a conference.
- 2016 UIC Graduate Student Council Travel Award.
- 2015 2-week Scholarship to Participate in Mining and Modeling of Neuroscience Data Course at UC Berkeley.

PUBLICATIONS

Journal Publications

- **C. Ma**, T. Luciani, A. Terebus, J. Liang, and G. E. Marai. PRODIGEN: Visualizing the Probability Landscape of Stochastic Gene Regulatory Networks in State and Time Space. BMC Bioinformatics, 18, no. 2 (2017): 24.
- **C. Ma**, A. Forbes, D.A. Llano, T. Berger-Wolf, and R.V. Kenyon. SwordPlots: Exploring Neuron Behavior within Dynamic Communities of Brain Networks. Journal of Imaging Science and Technology, Volume 60, Number 1, January 2016, pp. 10405-1-10405-13(13). **Charles E. Ives Journal Award.**

Peer-reviewed Conference Papers

- D. McNamara, J. Tapia, **C. Ma**, T. Luciani, A. Burks, J. Trelles, and G. E. Marai. Spatial Analysis of Employee Safety Using Organizable Event Quiltmaps. In *Proceedings of the IEEE VIS 2016 Workshop on Temporal & Sequential Event Analysis*, Baltimore, MD, USA, October 2016.
- **C. Ma**, R.V. Kenyon, A. Forbes, T. Berger-Wolf, B.J. Slater, and D.A. Llano. Visualizing Dynamic Brain Networks Using an Animated Dual-Representation. In *Proceedings of the Eurographics Conference on Visualization* (EuroVis'15 Short papers), pp. 73-77, Cagliari, Italy, May 2015.
- **C. Ma**, S. Liberman, and H. Zheng. GCLViz: Garbage Collection vs. Latency Visualization. In *Proceedings of the 5th International Conference on Information Visualization Theory and Applications* (IVAPP), pp. 292-299, Lisbon, Portugal, 5-8 January, 2014.

Poster/Abstract Presentations

- **C. Ma**, A. Burks, T. Luciani, A. Terebus, J. Liang, and G. E. Marai. Visualizing ensemble time-evolving probability landscapes of stochastic networks. To appear at BioVis 2017.
- T. Luciani, J. Trelles, **C. Ma**, A. Burks, M. M. Thomas, K. Bharadwaj, S. Singh, P. Hanula, L. Di and G. E. Marai. Multi-scale Voronoi-based ACT Assessment. IEEE VGTC VPG International Data-Visualization Contest, Baltimore, MD, USA, October 2016. **Honorable Mention.**
- T. Luciani, **C. Ma**, J. Trelles, and G. E. Marai. Developing a Data-Driven Wiki of Spatial-Nonspatial Integration Tools. In *Proceedings of the IEEE VIS 2016 Workshop on Creation, Curation, Critique and Conditioning of Principles and Guidelines in Visualization* (C4PGV), Baltimore, MD, USA, October 2016.
- **C. Ma**, R.V. Kenyon, T. Berger-Wolf, and D.A. Llano. Visualizing Communities in Dynamic Mouse Brain Networks. In *Proceedings of the IEEE Information Visualization Conference* (InfoVis'14), Paris, France, 9-14 November, 2014.

INVITED TALK

- "Visual Analysis Techniques for Dynamic Biological Systems", Brookhaven National Lab, NY, USA April 3, 2017
- "Introduction to Data Visualization and Visual Analytics", Nankai University, Tianjin, China June 13, 2014

SKILLS

Proficient with JavaScript (D3.js, three.js), C & C++, Java, Processing, HTML, CSS, and MATLAB; Familiar with R, Python, SQL, and UNIX Shell Scripts.

RELEVANT COURSEWORK

Computer Algorithms, User Interface Design and Programming, Visualization and Visual Analytics I & II, Image Analysis and Computer Vision I & II, Computer Graphics I & II, Virtual Reality, Artificial Intelligence I, Data Mining and Text Mining, Computational Ecology Field Course in Kenya.

PERSONAL

Hobbies: Pencil Sketch Drawing, Oil Painting, and Travel (17 countries across 4 continents)