

# Robin M. Weiss

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## Education:

- MSc, Computer Science, University of Chicago 2015
  - BA, Computer Science, Macalester College 2010
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## Technical Skills

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- *Coding/Development* –
    - C/C++, Python, Processing, Java, Matlab, Bash, Lisp, Fortran
    - Web development with PHP and HTML
    - Version control with Git and Subversion
  - *GPU and HPC Computing* –
    - Expert-level knowledge of the CUDA programming model and Nvidia GPU hardware
    - Parallel/distributed computing with MPI, OpenMP, and pthreads
    - Scheduled environments with SLURM and PBS/Torque
  - *Database* –
    - Fluent in MySQL and PostgreSQL, and a wide range of database APIs
  - *Systems/Networking* –
    - Design, implementation, and management of complex IP networks. Cisco IOS proficient
    - Systems monitoring/reporting with Nagios, RRDTool, SNMP, etc...
    - Experience with server maintenance, upgrade, and configuration
  - *Electronics* –
    - Digital and analog circuit design, stepper/servo motors and automation
    - Micro-controllers including: Arduino, ElectricImp, RasPi, Z80, etc...
    - Proficient in soldering and fabrication techniques, and usage of laboratory equipment
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## Research Experience

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**University of Chicago – Research Computing Center**

*4/12 – present*

*Researcher Application Engineer*

- **Research Areas:** High-Performance Computing, Numerical Modeling, Visualization
- **Responsibilities and Projects:**
  - Provide support to researchers using HPC resources at the University of Chicago
  - Lead development of custom, high-performance research software and workflows
  - Build, deploy, and support community and proprietary codes in an HPC environment
  - Deploy, manage, and maintain 3D visualization lab equipment

**University of Western Australia – Centre for Petroleum Geosciences**

9/11 – 3/12

*Researcher and Computing Support Staff*

- **Research Areas:** GPU-based Wave Propagation Algorithms, Inverse Problems
- **Responsibilities and Projects:**
  - Developed high-performance GPU-based seismic wave modeling codes
  - Managed computational resources including lab workstations and a development cluster
  - Implemented HPC processing systems for seismic data analysis

**Australia Commonwealth Scientific and Industrial Research Organization**

10/10 – 9/11

*Visiting International Researcher*

- **Research Areas:** HPC and GPU Computing, MicroCT Analysis, Inverse Problems
- **Responsibilities and Projects:**
  - Integrated HPC and novel algorithms with existing inverse problem solution workflows
  - Developed GPU-optimized image processing algorithms for microCT analysis

**University of Minnesota Supercomputing Institute**

5/09 – 10/10

*Undergraduate Researcher*

- **Research Areas:** GPU Computing, Collaborative Visualization, Distributed Computing
- **Responsibilities and Projects:**
  - Developed a collaborative web-based visualization system for large volumetric datasets
  - Designed, constructed, and maintained experimental GPU-based compute servers

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**Industry Experience**

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**NOAA - National Weather Service**

6/04 - 5/05

*Web-farm Administrator*

- Deployed a customized server and network monitoring system
- Assisted with rollout of Apache and Squid servers in a clustered environment
- Configured and maintained load balancing systems with LVS
- Upgraded internal network backbone to gigabit and fiber-based technology

**MetisLogic Consulting**

9/01 - 9/05

*Computer/Network Consultant*

- Owner-operated computer consulting business
- Provided comprehensive technology consulting services for small businesses and non-profits
- Maintained SOHO-class servers and networks

**Dental Systems Integrators, Inc.**

9/05-8/06 and 5/07-8/07

*Systems/Network Engineer*

- Provided remote, onsite, and phone support for clients' computer systems and networks
- Integrated digital x-ray and patient management systems into new and existing practices
- Planned and carried out extensive cabling and technology integration projects

*IT Administrator*

- Implemented an automated computer deployment and provisioning system
- Planned and carried out datacenter and network re-structuring projects
- Created and maintained documentation for internal IT systems

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**Selected Talks and Lectures**

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*March 26, 2014: Adding GPU-Acceleration to Open-Source 3D Elastic Wave Modeling*

Nvidia GPU Technology Conference 2014, San Jose, California, USA

*November 22, 2011: Finite-difference Time-domain Acoustic & Elastic Wave Modeling with GPU*

UWA:RM Research Consortium Annual Meeting, Perth, Australia

*July 22, 2011: GPU-Based Volumetric Image Processing and Connected Component Analysis*

2011 International Workshop on GPU Solutions to Multiscale Problems, Lanzhou, China

*December 24, 2010: GPU-Accelerated Data Mining with Swarm Intelligence*

Shanghai Supercomputer Center, Shanghai, China

*September 21, 2010: WebViz: A Prototype for Web-Based Interactive Visualization*

International Conference on Geodynamical Phenomena, Kiev, Ukraine

*August 7, 2010: Data Mining with Swarm Intelligence and Introduction to GPU Computing*

Chinese Academy of Sciences, Institute of Geology and Geophysics, Beijing, China

*July 28, 2010: GPU-Accelerated Swarm Intelligence Algorithms for Data Mining*

2010 International Workshop on GPU Solutions to Multiscale Problems, Harbin, China

*March 16, 2010: Data Mining with Swarm Intelligence and Introduction to GPU Computing*

Institute of Computer Science, AGH University, Krakow, Poland

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**Publications**

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- S Cacioppo, R M Weiss, H B Runesha, J T Cacioppo, *Dynamic spatiotemporal brain analyses using high performance electrical neuroimaging: Theoretical framework and validation*. Journal of Neuroscience Methods, December 30, 2014
- R B Gramacy, J Niemi, R M Weiss, *Massively parallel approximate Gaussian process regression*. SIAM/ASA Journal of Uncertainty Quantification, June 4, 2014
- S Cacioppo, C Frum, E Asp, R M Weiss, J W Lewis, J T Cacioppo, *A Quantitative Meta-Analysis of Functional Imaging Studies of Social Rejection*. Scientific Reports, June 19, 2013
- S Chakrabarti-Bell, S Wang, M J Patel, R M Weiss, P J Austin, *Bubbles in Chapatti Doughs*. Journal of Cereal Science 57 (2013), pp. 504-513
- R M Weiss, J Shragge, *Solving 3D anisotropic elastic wave equations on parallel GPU devices*, GEOPHYSICS, Vol. 78, No. 2, pp. F7-F15, March 2013
- R M Weiss, *Accelerating Swarm Intelligence Algorithms with GPU-Computing*, In GPU Solutions to Multi-Scale Problems in Science and Engineering, Chapter 31, Springer Berlin Heidelberg, 2013.

- Y Zhou, R M Weiss, E McArthur, D Sanchez, X Yao, D Yuen, M R Knox, W W Czech, ***WebViz: A Web-Based Collaborative Interactive Visualization System for Large-Scale Data Sets***, In GPU Solutions to Multi-Scale Problems in Science and Engineering, Chapter 37, Springer Berlin Heidelberg, 2013.
- S Zhang, R M Weiss, S Wang, G A Barnett Jr, D A Yuen, ***High Throughput Heterogeneous Computing and Interactive Visualization on a Desktop Supercomputer***, In GPU Solutions to Multi-Scale Problems in Science and Engineering, Chapter 39, Springer Berlin Heidelberg, 2013.
- R M Weiss, ***GPU-Accelerated Ant Colony Optimization***, In Wen-mei W. Hwu (Ed.), GPU Computing Gems Emerald, Chapter 22, Morgan Kaufmann Publishing, 2011
- R M Weiss, J C McLane, D A Yuen, S Wang, ***A Web-based Multi-user Interactive Visualization System For Large-Scale Computing Using Google Web Toolkit Technology***, Eos, Vol. 90, No. 52, 29 December 2009, Fall Meet. Suppl., Abstract IN41A-1106
- S Wang, S Zhang, R M Weiss, G A Barnett, D A Yuen, ***Commodity CPU-GPU System for Low-Cost, High-Performance Computing***, Eos, Vol. 90, No. 52, 29 December 2009, Fall Meet. Suppl., Abstract DI31A-1599