

Eric M. Heien

CONTACT INFORMATION

Computational Infrastructure for Geodynamics
Department of Geology
University of California, Davis
1 Shields Avenue
Davis, CA 95616

Voice: +1 (530) 752-3629
emheien _AT_ ucdavis.edu
<http://www.heien.org/research/>

CITIZENSHIP

USA

RESEARCH INTERESTS

parallel computing, high performance computing, parallel simulation of biological/chemical/physical systems, task scheduling and computing on desktop grids

EDUCATION

University of California, Davis, Davis, California, USA

Postdoctoral Studies, [Department of Geology](#), March 2010 - September 2010, June 2011 - January 2012

- Area of study: Large scale parallel simulation of earthquakes, mantle convection
- Advisors: Prof. Donald Turcotte, Prof. John Rundle, Prof. Louise Kellogg

INRIA, Grenoble Rhône-Alpes, France

Postdoctoral Studies, [INRIA](#), September 2010 - May 2011

- Area of study: Modeling and utilization of Internet oriented cloud computing, fault tolerance
- Advisor: Dr. Derrick Kondo

Osaka University, Osaka, Japan

Ph. D., [Graduate School of Information Science and Technology](#), March 2010

- Thesis Topic: Parallel Simulation of Large Scale Heterogeneous Biophysical Systems
- Advisor: Prof. Kenichi Hagihara
- Area of Study: Parallel and distributed computing

Doshisha University, Kyoto, Japan

Japanese Language Course Level VI (8000 words, 1500 kanji), September 2006

Independent Research in Evolutionary Algorithms, Advisor: Prof. Tomo Hiroyasu

University of California, Berkeley, Berkeley, California USA

B.A., Computer Science, May 2002

AWARDS AND GRANTS

UCDavis Awards

- UCDavis Staff Appreciation and Recognition Plan (STAR) Award, 2013
- XSEDE UCDavis Campus Champion, 2013

Computational Allocation Grants

- INCITE Directors Discretionary Allocation, 1,500,000 core-hours
- XSEDE Allocations, total of 1,500,000 core-hours
- NCAR Yellowstone Computing Allocation, 490,000 core-hours
- Campus Champion Allocation, 480,000 core-hours

Japan Society for the Promotion of Science

- Research Fellowship for Young Scientists, 2007-2010
- Grant-in-Aid for Scientific Research, 2007-2010

Global Center of Excellence for Predictive Medicine (*in silico* medicine) Infrastructure

- Grant for Young Researchers, 2007-2008

Space Sciences Laboratory

- Summer Student Research Fellowship, 2001

ACADEMIC AND PROFESSIONAL EXPERIENCE

University of California, Davis, Davis, CA

Lead Software Engineer (Programmer VII)

January 2012-present

- Lead developer for Computational Infrastructure for Geodynamics (CIG). Supervised three other developers and several postdocs, graduates, and undergraduates in research and development.
- Worked with geophysics scientists to develop and improve simulation codes, including sea level analysis, mantle convection simulations, wave propagation simulations using advanced numerical methods.
- Developed backend infrastructure for automated documentation and code testing/validation using BATLAB system.
- Acquired and utilized 4.3 million core-hours on multiple supercomputer systems for research work.
- Developed PHP/MySQL based website to manage software/publications and allow user interaction.

Osaka University, Osaka, Japan

Graduate Student

April 2007 to March 2010

- Japan Society for the Promotion of Science - Research Fellow (November 2007 to March 2010)

Teaching Assistant

Spring 2007 and Fall 2008

- Assisted Prof. Fujimoto in Parallel Programming course and Prof. Hagihara in Theory of Parallel Algorithms course.
- Provided in-class support to professor and students in Theory of Parallel Algorithms.
- Maintained and administered parallel computing cluster for Parallel Programming course.

Student Research Advisor

May 2008 to March 2010

- Developed research topics for undergraduate and masters students
- Met weekly with students to assess progress and make suggestions

UCBerkeley Space Sciences Laboratory, Berkeley, California USA

Student Engineering Aide

September 1999 to March 2002

- Developed, programmed and tested radio signal analysis algorithms (triplet, FFT, fast folding).
- Rewrote key sections of database code to significantly increase speed.
- Developed science features on web site, coded CGI to show computation results.
- Developed telescope automation program.
- Operated Optical SETI search program during summer 2000 and summer 2001.
- Supervised undergraduate students in development of SETI@home client.

Programmer/Analyst I

April 2002 to August 2003

- Key developer of [global distributed computing application BOINC](#).
- Designed and implemented client-application API, client-master communication protocol.
- Responsible for beta testing phase of client development.
- Supervised undergraduate students in development of BOINC volunteer computing system.

University of California, Berkeley, Berkeley, California USA

Undergraduate Researcher

December 1998 to March 2002

- Worked with Prof. Richard Fateman to develop mathematical equation interpreter and online graphing calculator in Java.
- Interfaced calculator to be front-end to a symbolic integration engine.
- Researched equation input systems and developed tree based GUI equation input and manipulation program.

Undergraduate Student

August 1998 to May 2002

PUBLICATIONS

International Journal Articles

Generic earthquake simulator

T.E. Tullis, K. Richards-Dinger, M. Barall, J.H. Dieterich, E.H. Field, **E.M. Heien**, L.H. Kellogg, F.F. Pollitz, J.B. Rundle, M.K. Sachs, D.L. Turcotte, S.N. Ward, M.B. Yikilmaz
Seismological Research Letters, vol. 83, No. 6, pp. 959-963, November 2012.

A Comparison among Observations and Earthquake Simulator Results for the allcal2 California Fault Model

T.E. Tullis, K. Richards-Dinger, M. Barall, J.H. Dieterich, E.H. Field, **E.M. Heien**, L.H. Kellogg, F.F. Pollitz, J.B. Rundle, M.K. Sachs, D.L. Turcotte, S.N. Ward, M.B. Yikilmaz
Seismological Research Letters, vol. 83, No. 6, pp. 994-1006, November 2012.

Virtual California Earthquake Simulator

M.K. Sachs, **E.M. Heien**, D.L. Turcotte, M.B. Yikilmaz, J.B. Rundle, L.H. Kellogg
Seismological Research Letters, vol. 83, No. 6, pp. 973-978, November 2012.

Understanding Long-Term Earthquake Behavior through Simulation

E.M. Heien, M.K. Sachs
Computing in Science & Engineering, vol. 14, pp. 10-20, September 2012.

A Correlated Resource Model of Internet End Hosts

E.M. Heien, D. Kondo, D. Anderson
IEEE Transactions on Parallel and Distributed Computing, vol. 23, no. 6, pp. 977-984, June 2012.

A fault and seismicity based composite simulation in northern California
M. B. Yikilmaz, **E.M. Heien**, D. L. Turcotte, J. B. Rundle, L. H. Kellogg
Nonlinear Processes in Geophysics, 18, 955-966, doi:10.5194/npg-18-955-2011, 2011.

Computing Low Latency Batches with Unreliable Workers in Volunteer Computing Environments
E. Heien, D. Anderson, K. Hagihara
Journal of Grid Computing, Vol. 7, No. 4, pp. 501-518, December 2009.

Optimization Techniques for Parallel Biophysical Simulations Generated by *insilicoIDE*
E. Heien, Y. Asai, T. Nomura, K. Hagihara
IPSJ Transactions on Advanced Computing Systems vol. 2 (2) pp. 131-143, July 2009.

Specifications of insilicoML 1.0: A Multilevel Biophysical Model Description Language
Y. Asai, Y. Suzuki, Y. Kido, H. Oka, **E. Heien**, M. Nakanishi, T. Urai, K. Hagihara, Y. Kurachi,
T. Nomura
The Journal of Physiological Sciences : JPS vol. 58 (7) pp. 447-458, 2008.

Refereed International Conference Papers (acceptance rates in parentheses)

Modeling and Tolerating Heterogeneous Failures in Large Parallel Systems
E. Heien, D. Kondo, A. Gainaru, D. LaPine, B. Kramer, F. Cappello
Supercomputing 2011, Seattle, USA, November 2011.
(21.0% acceptance rate, 74/352)

Correlated Resource Models of Internet End Hosts
E. Heien, D. Kondo, D. Anderson
31st International Conference on Distributed Computing Systems (ICDCS), Minneapolis, USA,
June 2011
(15.4% acceptance rate, 87/565)

A Multi-GPU Spectrometer System for Real-time Wide Bandwidth Radio Signal Analysis
H. Kondo, **E. Heien**, M. Okita, D. Werthimer, and K. Hagihara
8th International Symposium on Parallel and Distributed Processing with Applications, 2010,
Taipei, Taiwan

insilicoSim: an Extendable Engine for Parallel Heterogeneous Biophysical Simulations
E. Heien, M. Okita, Y. Asai, T. Nomura, K. Hagihara
3rd International ICST Conference on Simulation Tools and Techniques, Torremolinos, Spain,
March 2010.

PyMW: a Python Module for Parallel Master Worker Computing
E. Heien, A. Kornafeld, Y. Takata, K. Hagihara
1st International Conference on Parallel, Distributed and Grid Computing for Engineering, 2009,
Pécs, Hungary

Static Load Distribution for Communication Intensive Parallel Computing in Multiclusters
E. Heien, N. Fujimoto, K. Hagihara
16th Euromicro Conference on Parallel, Distributed and Network-Based Processing, Toulouse,
France, February 2008.

A Platform for in silico Modeling of Physiological Systems II. CellML Compatibility and Other
Extended Capabilities
Y. Suzuki, Y. Asai, T. Kawazu, M. Nakanishi, Y. Taniguchi, **E. Heien**, K. Hagihara, Y. Kurachi,
Y. Nomura
30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society,
2008, Vancouver, Canada, August 2008.

International Workshop Papers

Experiences with Automated Build and Test for Geodynamics Simulation Codes

E. Heien, T. Miller, B. Gietzel, L. Kellogg

Workshop on Sustainable Software for Science: Practice and Experiences, Supercomputing 2013, Denver, Colorado

<http://arxiv.org/abs/1309.1199>

PyMW - a Python Module for Desktop Grid and Volunteer Computing

E. Heien, A. Kornafeld, Y. Takata, K. Hagihara

3rd Workshop on Desktop Grids and Volunteer Computing Systems, May 2009, Rome, Italy (invited)

Computing Low Latency Batches with Unreliable Workers in Volunteer Computing Environments

E. Heien, N. Fujimoto, K. Hagihara

2nd Workshop on Desktop Grids and Volunteer Computing Systems, 2008, Miami, Florida

Refereed National Conference Papers

Optimization Techniques for Parallel Biophysical Simulations Generated by insilicoIDE

E. Heien, Y. Asai, T. Nomura, K. Hagihara

Information Processing Society of Japan (IPSJ) High Performance Computing Symposium, 2009, Tokyo, Japan

(in Japanese) Development of insilicoML 1.0: A Language for Multilevel Physiological Models

Y. Asai, Y. Suzuki, Y. Kido, H. Oka, **E. Heien**, M. Nakanishi, T. Urai, K. Hagihara, Y. Kurachi, T. Nomura

Biology Medicine and Engineering Symposium 2008, Osaka, Japan

(in Japanese) insilicoIDE: An Integrated Development Environment for Physiological Modeling

Y. Suzuki, Y. Asai, **E. Heien**, M. Nakanishi, T. Urai, H. Oka, K. Hagihara, Y. Kurachi, T. Nomura

Biology Medicine and Engineering Symposium 2008, Osaka, Japan

(in Japanese) The Massive Simulation of the Spinal Neural Network Dynamics using Biodynamics Modeling Integration Platform (insilico IDE)

M. Nakanishi, Y. Asai, **E. Heien**, K. Hagihara, T. Nomura

The 47th Annual Conference of Japanese Society for Medical and Biological Engineering, 2008, Kobe, Japan

(in Japanese) The insilicoIDE Integrated Platform and Architecture for Multilayer Object Oriented Biodynamics Modeling

Y. Asai, T. Kawazu, M. Nakanishi, Y. Suzuki, **E. Heien**, K. Hagihara, Y. Kurachi, T. Nomura

The 47th Annual Conference of Japanese Society for Medical and Biological Engineering, 2008, Kobe, Japan

Other

Modeling Mantle Mixing in 3D with Adaptive Mesh Refinement and Implications for Mantle Reservoirs

L.H. Kellogg, **E.M. Heien**, T. Heister, W. Bangerth

AGU (American Geophysical Union) Fall Meeting, December 2012, San Francisco, CA, USA.

An Analysis of ASPECT Mantle Convection Simulator Performance and Benchmark Comparisons

E.M. Heien, T. Heister, W. Bangerth, L.H. Kellogg

AGU (American Geophysical Union) Fall Meeting, December 2012, San Francisco, CA, USA.

Dynamics, Patterns, and Migration in Earthquake Fault Systems

J.B. Rundle, M.K. Sachs, J.R. Holliday, **E.M. Heien**, D.L. Turcotte, A. Donnellan, Z. Meadows
AGU (American Geophysical Union) Fall Meeting, December 2012, San Francisco, CA, USA.

Virtual California: studying earthquakes through simulation

M.K. Sachs, **E.M. Heien**, D.L. Turcotte, M.B. Yikilmaz, , J.B. Rundle, L. H. Kellogg
AGU (American Geophysical Union) Fall Meeting, December 2012, San Francisco, CA, USA.

Improving Particle Integration Efficiency in Mantle Convection Simulation by Combining Numerical Integration Techniques

E.M. Javan, E.H. Studley, **E.M. Heien**, L. H. Kellogg
AGU (American Geophysical Union) Fall Meeting, December 2012, San Francisco, CA, USA.

An Analysis of Tradeoffs in Element Size and Approximation Schemes for Earthquake Simulation

E. Heien, M. Sachs, Z. Meadows, J. Rundle, D. Turcotte, L. Kellogg
APEC Cooperation for Earthquake Simulation (ACES) 8th International Workshop, October 2012, Maui HI, USA.

New Developments in Virtual California/High Resolution Earthquake Simulation using Rate-State Friction in ViCaRS

E. Heien, M. Sachs, G. Danziger, J. Rundle, L. Kellogg
SCEC (Southern California Earthquake Center) Annual Meeting, September 2012, Palm Springs CA, USA.

Characterizing Kinematics of Passive Tracer Paths in Simulations of Mantle Convection in a 3D Spherical Shell

J.A. Peterson, S. Schröder, **E.M. Heien**, H. Obermaier; D.L. Turcotte, L.H. Kellogg, H. Hagen
AGU (American Geophysical Union) Fall Meeting, December 2011, San Francisco, CA, USA.

Visualization of Flow Properties in Mantle Convection: Understanding Homogenization in CitcomS

S. Schröder, J.A. Peterson, **E.M. Heien**, H. Obermaier, D.L. Turcotte, L.H. Kellogg, H. Hagen
AGU (American Geophysical Union) Fall Meeting, December 2011, San Francisco, CA, USA.

Using Speculative Execution to Reduce Communication in a Parallel Large Scale Earthquake Simulation

E. Heien, M. B. Yikilmaz, M. K. Sachs, J.B. Rundle, L.H. Kellogg, D.L. Turcotte
AGU (American Geophysical Union) Fall Meeting, December 2011, San Francisco, CA, USA.

Parallelization of the Virtual California Earthquake Simulator

E. Heien, B. Yikilmaz, M. Sachs, D. Turcotte, J. Rundle, L. Kellogg
SCEC (Southern California Earthquake Center) Annual Meeting, September 2011, Palm Springs CA, USA

Comparisons Among Earthquake Simulator Results for UCERF2 Fault Model of California and Observed Seismicity

T. Tullis, K. Richards-Dinger, M. Barall, J. Dieterich, E. Field, **E. Heien**, L. Kellogg, F. Pollitz, J. Rundle, M. Sachs, D. Turcotte, S. Ward, B. Yikilmaz, O. Zielke
SCEC (Southern California Earthquake Center) Annual Meeting, September 2011, Palm Springs CA, USA

The Future of Virtual California Earthquake Simulations

B. Yikilmaz, J. Rundle, D. Turcotte, **E. Heien**, M. Sachs, L. Kellogg
SCEC (Southern California Earthquake Center) Annual Meeting, September 2011, Palm Springs CA, USA

Understanding Earthquake Dynamics with Numerical Simulations

J. B. Rundle, **E. Heien**, M. B. Yikilmaz, M. K. Sachs, D. Turcotte, L. Kellogg, A. Donnellan, K. Tiampo

AOGS (Asia Oceania Geosciences Society) Meeting, August 2011, Taipei, Taiwan

Re-evaluation of Event Correlations in Virtual California Using Statistical Analysis

M. Glasscoe, M. Heflin, R. Granat, M. Yikilmaz, **E. Heien**, J. Rundle, A. Donnellan

AGU (American Geophysical Union) Fall Meeting, December 2010, San Francisco, CA, USA

Preliminary Results from SCEC Earthquake Simulator Comparison Project

T. Tullis, M. Barall, K. Richards-Dinger, S. Ward, **E. Heien**, O. Zielke, F. Pollitz, J. Dieterich, J. Rundle, B. Yikilmaz, D. Turcotte, L. Kellogg, E. Field

AGU (American Geophysical Union) Fall Meeting, December 2010, San Francisco, CA, USA

Correlated Resource Models of Internet End Hosts

E. Heien, D. Kondo, D. Anderson

INRIA Research Report, November 2010

SCEC Earthquake Simulator Comparison Project

T.E. Tullis, M. Barall, K. Richards-Dinger, S.N. Ward, **E. Heien**, O. Zielke, F. Pollitz, J. Dieterich, J. Rundle, B. Yikilmaz, D. Turcotte, L. Kellogg, E.H. Field

APEC Cooperation for Earthquake Simulation International Workshop, October 2010, Hokkaido, Japan

Limitations and Tradeoffs in Large Scale Earthquake Simulation

E. Heien, B. Yikilmaz, D. Turcotte, J. Rundle, L. Kellogg

SCEC (Southern California Earthquake Center) Annual Meeting, September 2010, Palm Springs CA, USA

Preliminary Results for N CA from Earthquake Simulator Comparison Project

T.E. Tullis, M. Barall, K. Richards-Dinger, S.N. Ward, **E. Heien**, O. Zielke, F. Pollitz, J. Dieterich, J. Rundle, B. Yikilmaz, D. Turcotte, L. Kellogg, E.H. Field

SCEC (Southern California Earthquake Center) Annual Meeting, September 2010, Palm Springs CA, USA

(in Japanese) MapReduce Implementation in Python for Multiple Parallel Computing Environments

Y. Takata, **E. Heien**, M. Okita, K. Hagihara

Research Report of the IPSJ, 2009-ARC-185, (2009-10). 7 pages

Techniques for Automatic Parallelization and Optimization of Biological Simulations from insilicoIDE

E. Heien, Y. Asai, T. Nomura, K. Hagihara

3rd MEI International Symposium, December 2008, San Francisco, CA, USA

Automatic Parallelization of Biological Simulations from the in Silico IDE for Execution in Cluster Environments

E. Heien, M. Nakanishi, Y. Asai, T. Nomura, K. Hagihara

2nd MEI International Symposium, December 2007, Osaka, Japan

Investigation of Mutation Operators for the Bayesian Optimization Algorithm

E. Heien, T. Hiroyasu, N. Fujimoto

9th Conference on Genetic and Evolutionary Computation, 2007, London England

Latest Results of the SETHI Survey at Arecibo

E. J. Korpela, **E. M. Heien**, D. Werthimer

How Does the Galaxy Work? A Galactic Tertulia with Don Cox and Ron Reynolds, 2004 vol. 315 pp. 97

Three Years of SETI@home: A Status Report

E. J. Korpela, J. Cobb, S. Fulton, M. Lebofsky, **E. Heien**, E. Person, P. Demorest, R. Bankay, D. Anderson, D. Werthimer

Bioastronomy 2002: Life Among the Stars 2004 vol. 213 pp. 419

SETHI@Berkeley- A Piggyback 21-cm Sky Survey at Arecibo

E. J. Korpela, **E. M. Heien**, D. Werthimer

Seeing Through the Dust: The Detection of HI and the Exploration of the ISM in Galaxies 2002 vol. 276 pp. 100

Berkeley radio and optical SETI programs: SETI@home, SERENDIP, and SEVENDIP

D. Werthimer, D. Anderson, C. S. Bowyer, J. Cobb, **E. Heien**, E. J. Korpela, M. L. Lampton, M. Lebofsky, G. W. Marcy, M. McGarry, D. Treffers

Proc. SPIE Vol. 4273 vol. 4273 pp. 104-109, August 2001.

Pulse Detection Algorithms for Use in SETI@home

E. J. Korpela, **E. M. Heien**, D. Werthimer

American Astronomical Society 2000 vol. 197 pp. 1492

VISITS

- Dr. Dan Werthimer and Dr. David P. Anderson, UC Berkeley, Dr. David Skinner, NERSC, December 2010. Worked on GPU based radio signal analysis system, discussed Internet host resource model.
- Adam Kornafeld, SZTAKI Institute, April 2009. Discussed techniques for improving Python based parallel volunteer computing. Discussed task scheduling for improved energy efficiency in volunteer computing systems.
- Dr. Dan Werthimer and Dr. David P. Anderson, UC Berkeley, March 2009. Discussed feasibility of GPU based radio signal analysis system.
- Dr. Derrick Kondo, INRIA Grenoble - Rhône Alps, February 2008. Discussed scheduling for volunteer computing systems and fairness in terms of task scheduling.

PROFESSIONAL EXPERIENCE

Japan Exchange and Teaching Program, Kurashiki, Okayama Japan

Assistant Language Teacher

August 2003 to August 2005

- Taught English conversation, reading and writing to students at Kojima High School and Kojike High School in Japan.
- Created curricula and supervised over 400 students.

Davis Energy Group, Davis, California USA

Software Engineering Consultant

December 1998 to August 1999

- Developed and maintained organization website.
- Developed prototype thermostat user interface design in Java.
- Programmed microcontroller LCD based thermostat interface in C.

Schilling Robotics, Davis, California USA

Programmer

May 1999 to August 1999

- Developed web site organization, HTML code, and Flash web site.
- Developed interactive front-end for company informational CD.
- Supervised other student workers to maintain and develop web site.

Software Engineering Consultant

September 1996 to August 1998

- Developed web site organization, HTML code, and Flash web site.
- Developed interactive technical manuals for robotic manipulator systems.

ACADEMIC LEADERSHIP AND SERVICE

- Program Chair for the 5th Workshop on Desktop Grids and Volunteer Computing Systems (PCGrid 2011), Anchorage, Alaska
- Program Committee Member for the 17-22nd Euromicro International Conference on Parallel, Distributed, and Network-Based Processing (PDP2009-PDP2014)
- Reviewer for IEEE Transactions on Parallel and Distributed Computing, Journal of Grid Computing, Future Generation Computer Systems, Euro-Par 2011, Parallel Computing

ADVISING

- Ted Studley, University of California, Davis, 2012-2013
- Emily Javan, University of California, Davis, 2012-2013
- Alex Takakuwa, University of California, Davis, 2012, now doing PhD at University of Washington
- Hirofumi Kondo, Osaka University, 2009-2010
- Takata Yusuke, Osaka University, 2008-2010
- Jeremy Cowles, Google Summer of Code, 2009, now at Pixar
- Seth Cooper, BOINC summer student 2003, now at University of Washington
- Cecile Kim, SETI@home summer student, 2002
- Michael Gary, SETI@home summer student, 2002

SOFTWARE

ViCaRS (currently not publicly available)

Developer for ViCaRS, an earthquake fault interaction simulator using rate-state friction.

Aspect (<http://dealii.org/aspect>)

Developer for Aspect, a finite element thermochemical convection simulator for geophysics studies of mantle convection. Worked on parallel output, particle method implementation, parallel scaling.

CitcomS (<http://geodynamics.org/cig/software/citcoms>)

Developer for CitcomS, a finite element thermochemical convection simulator for geophysics studies of mantle convection. Worked on conversion and restructuring of code to C++, optimization of particle flow dynamics.

Virtual California (currently not publicly available)

Lead developer of Virtual California (VC), a simulation engine for analyzing long term behavior of strike-slip earthquake faults using a sliding-block model. VC supports both OpenMP and MPI based parallel computing for large scale models on the order of hundreds of thousands of elements requiring hundreds of GB of memory to compute.

PyMW (<http://pymw.sourceforge.net/>)

Lead developer of PyMW (Python Master Worker), a Python library providing a seamless interface for master worker style computing in multiple environments. This was successfully applied to performing a large computation with donated resources for an academic class, and was used as a base for a generalized MapReduce implementation.

insilicoSim/*insilicoIDE* (<http://physiome.jp/>)

Lead developer of *insilicoSim* and co-developer of *insilicoIDE*. These are tools for modeling and simulating biophysical systems. *insilicoSim* was successfully applied to performing simulations of small and large scale heterogeneous models on single and multiprocessor systems.

TECHNICAL SKILLS

Extensive hardware and software experience in networking and information technology

Programming: C, C++, Java, MPI, Python, PHP, UNIX shell scripting, SQL, SVN, and others

Applications: \TeX , \LaTeX , \BibTeX , Microsoft Office, and other common productivity packages for Windows, OS X, and Linux platforms

Operating Systems: Microsoft Windows XP/Vista, Apple OS X, Linux, and other UNIX variants

COLLABORATORS

John Rundle, UC Davis, USA.

Louise Kellogg, UC Davis, USA.

Donald Turcotte, UC Davis, USA.

Derrick Kondo, INRIA Grenoble Rhone-Alps, France.

Adam Kornafeld, SZTAKI Institute, Hungary.

Yoshiyuki Asai, Osaka University, Japan.

Taishin Nomura, Osaka University, Japan.

David Anderson, UC Berkeley, USA.

Dan Werthimer, UC Berkeley, USA.

REFERENCES

Available upon request.