

CHAIWOOT BOONYASIRIWAT

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RESEARCH INTERESTS

Scientific computing, numerical analysis, high-performance computing, software development

EDUCATION

Ph.D., Scientific Computing, University of Utah, 2009

Dissertation: Fixed-point Computation and Seismic Waveform Tomography

M.S., Geophysics, University of Utah, 2009

Thesis: Application of Waveform Inversion to Two-dimensional Gulf of Mexico Data

M.S., Computational Engineering and Science, University of Utah, 2004

Thesis: FORTRAN 77 Implementation of the Circumscribed Ellipsoid Algorithm

B.S., Physics, Mahidol University, 2002

Project: Calculating the Magnetotelluric Sensitivity Matrix using Reciprocity

WORK EXPERIENCE

Lecturer, April 2011 – Present

Department of Physics, Faculty of Science, Mahidol University

Postdoctoral Research Fellow, September 2009 – February 2011

Center for Seismic Imaging and Fluid Modeling (CSIM)

King Abdullah University of Science and Technology, Saudi Arabia

Research Assistant, 2005-2009

Utah Tomography and Modeling/Migration (UTAM) Consortium

Department of Geology and Geophysics, University of Utah, USA

Intern, Summer 2008

ConocoPhillips, Houston, Texas, USA

Responsibility: velocity estimation of 2D land data from the Canadian Foothills using seismic waveform tomography

Intern, Summer 2007

ConocoPhillips, Houston, Texas, USA

Responsibility: velocity estimation of 2D synthetic data using seismic waveform tomography

Intern, Fall 2006

INCO, Canada

Responsibility: software development for traveltime tomography

Intern, Summer 2006

Total, Houston, Texas, USA

Responsibility: 2D plane-wave migration in tilted coordinates

Research Assistant, 2002-2004

Computational Science and Engineering Online (CSEO) Project

Department of Chemistry, University of Utah, USA

Research: scientific visualization and software development

PUBLICATIONS

1. N. Wichailukkana, B. Novaprateep, and **C. Boonyasiriwat**, 2016, A convergence analysis of the numerical solution of boundary-value problems by using two-dimensional Haar wavelets, *ScienceAsia* **42**, 346-355.
2. G. Zhan, W. Dai, **C. Boonyasiriwat**, and G. T. Schuster, 2013, Acoustic multi-source full waveform inversion with deblurring, *Journal of Seismic Exploration* **22**, no. 5, 477-488.
3. W. Cao, S. M. Hanafy, G. T. Schuster, G. Zhan, and **C. Boonyasiriwat**, 2012, High-resolution and super stacking of time-reversal mirrors in locating seismic sources, *Geophysical Prospecting* **60**, no. 1, 1-17.
4. **C. Boonyasiriwat**, K. Sikorski, and C. Tsay, 2011, Circumscribed ellipsoid algorithm for fixed points: *Mathematics of Computation* **80**, no. 275, 1703-1723.
5. G. T. Schuster, W. Dai, G. Zhan, and **C. Boonyasiriwat**, 2011, Theory of multisource crosstalk reduction by phase-encoded statics: *Geophysical Journal International* **184**, no. 3, 1289-1303.
6. **C. Boonyasiriwat**, G. T. Schuster, P. Valasek, and W. Cao, 2010, Applications of waveform inversion to marine data: *Geophysics* **75**, no. 6, R129-R136.
7. **C. Boonyasiriwat**, P. Valasek, P. Routh, B. Macy, W. Cao, and G. T. Schuster, 2009, A multiscale method for time-domain waveform tomography, *Geophysics* **74**, no. 6, WCC59-WCC68.
8. **C. Boonyasiriwat**, 2009, Fixed-point Computation and Seismic Waveform Tomography, Ph.D. Dissertation, University of Utah.
9. **C. Boonyasiriwat**, 2009, Application of Waveform Inversion to Two-dimensional Gulf of Mexico Data, M.S. Thesis, University of Utah.
10. **C. Boonyasiriwat**, P. Valasek, P. Routh, and X. Zhu, 2009, Application of multiscale waveform tomography for high-resolution velocity estimation in complex geologic environments: Canadian Foothills synthetic data example, *The Leading Edge* **28**, 454.
11. **C. Boonyasiriwat**, K. Sikorski, and C. Xiong, 2007, A note on two fixed point problems: *Journal of Complexity* **23**, 952-961.
12. Truong, T. N., M. Nayak, H. H. Huynh, T. Cook, P. Mahajan, L. T. Tran, J. Bharath, S. Jain, H. B. Pham, **C. Boonyasiriwat**, N. Nguyen, E. Andersen, Y. Kim, S. Choe, J. Choi, T. E. Cheatham, III, and J. C. Facelli, 2006, Computational Science and Engineering Online (CSEOnline): A cyber-infrastructure for scientific computing, *Journal of Chemical Information and Modeling* **46**, 971-984.

13. Truong, T. N., T. Cook, M. Nayak, **C. Boonyasiriwat**, L. T. Tran, and S. Zhang, 2004, Computational Science and Engineering On-line: an integrated web-based environment for multi-scale modelling of complex reaction systems, *Molecular Physics* **102**, 4, 353-360.
14. **C. Boonyasiriwat**, 2004, FORTRAN 77 Implementation of the Circumscribed Ellipsoid Algorithm, M.S. Thesis, University of Utah.

CONFERENCE PROCEEDINGS AND PRESENTATIONS

1. Meesawasdi, N., **C. Boonyasiriwat**, S. Kongnuan, and F. Chamchod, 2016, Finite element modeling for stress analysis of a buried pipeline under soil and traffic loads, IEEE International Conference on Industrial Engineering and Engineering Management, December 4-7, Bali, Indonesia.
2. Yosprakob, T., **C. Boonyasiriwat**, and F. Chamchod, 2016, An investigation of chloride penetration and maintenance strategies for concrete structures by a modeling approach, IEEE International Conference on Industrial Engineering and Engineering Management, December 4-7, Bali, Indonesia.
3. Yutthanasirikul, P., and **C. Boonyasiriwat**, 2015, Comparison between weakly compressible and implicit incompressible smoothed particle hydrodynamics, The 19th International Annual Symposium on Computational Science and Engineering, June 17-19, Ubon Ratchathani, Thailand.
4. Thongyoy, W., and **C. Boonyasiriwat**, 2015, Least-Squares Finite Difference Operator, The 19th International Annual Symposium on Computational Science and Engineering, June 17-19, Ubon Ratchathani, Thailand.
5. **Boonyasiriwat, C.**, 2012, Special lecture on seismic modeling and full-waveform inversion, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
6. **Boonyasiriwat, C.**, 2012, Global-scale seismic full-waveform inversion, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
7. **Boonyasiriwat, C.**, 2012, Seismic full-waveform inversion on GPU, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
8. **Boonyasiriwat, C.**, 2012, Quality improvement of seismic first-arrival events using seismic refraction interferometry, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
9. Dechapunya, A., and **C. Boonyasiriwat**, 2012, Global-scale seismic travel time tomography in MATLAB, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
10. Romphosri, S., and **C. Boonyasiriwat**, 2012, Multisource seismic full-waveform inversion, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
11. Sinsawasmongkol, J., and **C. Boonyasiriwat**, 2012, Surface wave prediction using seismic interferometry, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
12. Somboon, P., and **C. Boonyasiriwat**, 2012, Migration of VSP multiples using seismic interferometry, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.

13. Warapathirunmas, C., and **C. Boonyasiriwat**, 2012, Seismic data trace interpolation using seismic interferometry, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
14. Rotjananirunkit, N., and **C. Boonyasiriwat**, 2012, Gravity modeling and inversion in MATLAB, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
15. Nakpathom, A., and **C. Boonyasiriwat**, 2012, Blind deconvolution of seismic data, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
16. Sitsungnoen, P., and **C. Boonyasiriwat**, 2012, Tsunami simulation in MATLAB, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
17. Nualkhao, P., **C. Boonyasiriwat**, and P. Charusiri, 2012, Paleoseismic study of fault zones in Xaignabouli, Laos PDR, using digital image stratigraphic analysis, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
18. Nualkhao, P., W. Siripunvaraporn, P. Amatyakul, and **C. Boonyasiriwat**, 2012, The study of the formation of Hindat hot-spring, Kanchanaburi Province, using 2-D direct-current resistivity method, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
19. Satitpittakul, A., W. Siripunvaraporn, and **C. Boonyasiriwat**, 2012, Mapping active faults with seismic reflection and refraction methods in Kanchanaburi Province, western Thailand, The 6th International Conference on Applied Geophysics, November 15-17, Kanchanaburi, Thailand.
20. **Boonyasiriwat, C.**, and W. Siripunvaraporn, 2012, Cavity detection using seismic full-waveform inversion, The 7th Annual Conference of the Thai Physics Society, 82.
21. Sinsawasmongkol, J., and **C. Boonyasiriwat**, Straight-Ray Seismic Traveltime Tomography, The 7th Annual Conference of the Thai Physics Society, 180.
22. **Boonyasiriwat, C.**, 2011, Solving local minima problem of seismic waveform inversion, The 37th Congress on Science and Technology of Thailand, 103-104.
23. **Boonyasiriwat, C.**, and G. T. Schuster, 2010, 3D multisource full-waveform inversion using dynamic random phase encoding, Proceeding of Society of Exploration Geophysicists, Expanded Abstracts, 1044-1049.
24. W. Dai, G. T. Schuster, and **C. Boonyasiriwat**, 2010, 3D multi-source least-squares reverse time migration, Proceeding of Society of Exploration Geophysicists, Expanded Abstracts, 3120-3124.
25. **Boonyasiriwat, C.**, G. Zhan, M. Hadwiger, M. Srinivasan, and G. T. Schuster, 2010, Multisource reverse-time migration and full-waveform inversion on a GPGPU, Proceeding of The 72th European Association of Geoscientists and Engineers Conference & Exhibition, Barcelona, Spain, June 14-17.
26. **Boonyasiriwat, C.**, and G. T. Schuster, 2010, 3D multisource full-waveform inversion using dynamic quasi-Monte Carlo phase encoding, Proceeding of European Geosciences Union General Assembly, Vienna, Austria, May 3-7.
27. **Boonyasiriwat, C.**, and G. T. Schuster, 2010, Target-oriented full-waveform inversion, Proceeding of European Geosciences Union General Assembly, Vienna, Austria, May 3-7.
28. **Boonyasiriwat, C.**, P. Valasek, P. Routh, W. Cao, G. T. Schuster, and B. Macy, 2008, An application of time-domain multiscale waveform tomography to marine data, Proceeding of Society of Exploration Geophysicists, Expanded Abstracts **27**, 3704.
29. Cao, W., G. T. Schuster, G. Zhan, S. M. Hanafy, and **C. Boonyasiriwat**, 2008, Demonstration of super-resolution and super-stacking properties of time reversal mirrors in locating seismic sources, Proceeding of Society of Exploration Geophysicists, Expanded Abstracts **27**, 3018.

30. Cao, W., T. W. Fei, Y. Luo, M. N. Alfaraj, G. T. Schuster, and **C. Boonyasiriwat**, 2008, Estimation of hydro-fracture source location with time reversal mirrors, *Proceeding of Society of Exploration Geophysicists, Expanded Abstracts* **27**, 1421.
31. **Boonyasiriwat, C.**, P. Valasek, P. Routh, W. Cao, G. T. Schuster, and B. Macy, 2008, Multiscale waveform tomography with an adaptive early-arrival muting window, *Workshop on Full Waveform Inversion, The 70th EAGE Conference & Exhibition, Rome, Italy*.
32. J. B. Willis, **C. Boonyasiriwat**, and G. T. Schuster, 2004, Digital Log of the Mapleton, Utah Mega-trench: Optical Analysis of a Trench Wall Using Morphological Image Processing Operations, *Geoscience in a Changing World, 2004 Annual Meeting & Exposition, Denver*.
33. **Boonyasiriwat, C.**, and W. Siripunvaraporn, 2002, One-dimensional Electromagnetic Modeling using Finite Difference and Finite Element Methods: The Magnetotelluric Method, *London International Youth Science Forum (LIYSF), London*.
34. **Boonyasiriwat, C.**, and W. Siripunvaraporn, 2002, Calculating the Magnetotelluric Sensitivity Matrix using Reciprocity, *The 6th Annual National Symposium on Computational Science and Engineering, April 3-5, Thailand*.
35. **Boonyasiriwat, C.**, and W. Siripunvaraporn, 2001, Algorithm for generating an adaptive grid for solving one-dimensional Maxwell's equations, *The 27th Congress on Science and Technology of Thailand, 17-08P-01, 366-367*.
36. **Boonyasiriwat, C.**, and K. Jaroensutasinee, 1999, Simulation of wave motion by JAVA, *The 25th Congress on Science and Technology of Thailand, G-01, 1198-1199*.
37. **Boonyasiriwat, C.**, and K. Jaroensutasinee, 1998, The Projectile Motion CAI using JAVA, *The 49th INTEL International Science and Engineering Fair (ISEF), Fort Worth, Texas*.

GRANTS AND FELLOWSHIPS

- Research grant from PTTEP, 2013
- Research grant from Thailand Research Fund, 2011-2012
- Scholarship from the Development and Promotion of Science and Technology Talents Project (DPST) of Thailand, 1995-2008
- Research grant from the Junior Science Talent Project (JSTP) of Thailand, 2001
- Software development grants from the National Electronic and Computer Technology Center (NECTEC), Thailand, 1997-2001

AWARDS AND HONORS

- Outstanding Physics Student with the Highest GPA Award from Professor Taeb Nilanithi Foundation, Thailand, 2002
- Outstanding Science Student from the Mahidol University, Thailand, 2002
- Outstanding Physics Student with the Highest GPA Award from Faculty of Science, Mahidol University, Thailand, 2001
- Second-prize education software in NECTEC Small Software Competition, Thailand, 1998
- First-prize internet software in NECTEC Small Software Competition, Thailand, 1997