

CURRICULUM VITAE -- DAFANG WANG

Scientific Computing and Imaging Institute
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PROFILE

- PhD in computer science. Thesis: finite element solutions to inverse electrocardiography (ECG).
- Expertise in optimization, partial differential equations, large-scale parallel computing.
- Biophysical simulation: image process, geometric modeling, numerical computing, statistical analysis.
- Interdisciplinary research experience: ECG, cardiac electrophysiology, ischemia/defibrillation modeling.
- Programming skill: fluent in Matlab, C/C++; experienced in COMSOL, Office and Adobe software

EDUCATION

Ph.D., Computer Science, *University of Utah* 2005 - Present
Advisors: Chris Johnson (crj@sci.utah.edu), Mike Kirby (kirby@sci.utah.edu) GPA:3.88

B.Eng., Computer Science, *Zhejiang University, China*. Honor graduates. GPA:3.79 2001- 2005
Member of the Mixed Class in Chu Kechen Honors College (top 5% students).

RESEARCH & PROFESSIONAL EXPERIENCE

Research Assistant, *Scientific Computing & Imaging Institute, University of Utah* 2006 - Present
- Developed optimization methods for various inverse problems in ECG: recovering epicardial source, bidomain heart source, and localizing ischemia.

Research Assistant, *NIH Center for Integrative Biomedical Computing, SCI Institute* 2006 - Present
- Developed h/p finite element methods for image-based ECG/EEG forward/inverse simulation.

External Technical Consultant, *St. Jude Medical, Minnesota* Nov 2011 - Present
- Prototyping catheter-based diagnosis and treatment within heart chambers.

Teaching Assistant, *School of Computing, University of Utah* 2005-2006
- TA for 3 courses: scientific computing, computer networks, visual computing (graduate level).

Summer intern, *Gridwise Technology, Krakow, Poland* Aug-Sept, 2004
- Worked on web search engine optimization.

PUBLICATIONS

Journal Publications

1. **Dafang Wang**, Robert M. Kirby, Rob S. MacLeod, Chris R. Johnson. "Inverse electrocardiographic source localization of ischemia: an optimization framework and finite element solution", *Journal of Computational Physics*, 2012, under review.
2. **D. Wang**, R.M. Kirby, C.R. Johnson. "Finite-element-based discretization and regularization strategies for 3D inverse electrocardiography", *IEEE Transactions on Biomedical Engineering*, 2011.
3. **D. Wang**, R.M. Kirby, C.R. Johnson. "Resolution Strategies for the Finite Element Based Solution of the Electrocardiographic Inverse Problem", *IEEE Trans on Biomedical Engineering*, 2010.

Refereed Conference Papers

1. **D. Wang**, R.M. Kirby, R.S. MacLeod, C.R. Johnson. "An Optimization Framework for Inversely Estimating Myocardial Transmembrane Potentials and Localizing Ischemia", *IEEE Engineering in Medicine and Biology*

Society Conference (EMBC), 2011.

2. B. Burton, J. Tate, B. Erem, **D. Wang**, D. Brooks, P. van Dam, R. MacLeod. "A Toolkit for Forward/Inverse Problems in Electrocardiography within the SCIRun Problem Solving Environment", EMBC, 2011.
3. **D. Wang**, R.M. Kirby, R. MacLeod, C.R. Johnson. "Identifying Myocardial Ischemia by Inversely Computing Transmembrane Potentials from Body-Surface Potential Maps", *International Conference on Bioelectromagnetism, 2011.*
4. **D. Wang**, R.M. Kirby, R. MacLeod, C.R. Johnson. "A new family of variational-form-based regularizers for reconstructing epicardial potentials from body-surface mapping", *Computing in Cardiology, 2010.*
5. **D. Wang**, R.M. Kirby, C.R. Johnson. "Finite Element Refinements for Inverse Electrocardiography: Hybrid-Shaped Elements and High-Order Element Truncation", *Computing in Cardiology, 2009.*
6. **D. Wang**, R.M. Kirby, C.R. Johnson. "Finite Element Discretization Strategies for the Inverse Electrocardiographic Problem", *World Congress on Medical Physics and Biomedical Engineering, 2009.*
7. M. Milanic, V. Jazbinsek, **D. Wang**, R. Macleod et al. "Evaluation of Approaches of Solving Electrocardiographic Imaging Problem", *Computing in Cardiology, 2009.*

Refereed Short Papers & Abstracts

1. **D. Wang**, R.M. Kirby, C.R. Johnson. "Noninvasive detection of myocardial ischemia: An inverse problem in electrocardiography", *Applied Inverse Problems Conference, 2011.*
2. **D. Wang**, R.M. Kirby, R. MacLeod, C.R. Johnson. "Localizing Myocardial Ischemia by Computing Transmembrane Potentials from Body-Surface Measurements", *Utah Biomedical Engineering Conference, 2011.*

INVITED REVIEWS

- International Journal of Computer Assisted Radiology and Surgery 2011
- International Journal of Information and Computer Science 2012
- Computing Science and Technology International Journal 2011
- IEEE Engineering in Medicine and Biology Society Conference 2010 - 2012

HONORS & AWARDS

- Conference travel award, Applied Inverse Problems Conference, 2011
- Conference travel award, University of Utah, 2010

INTERNAL SERVICE

- Member of the student board at the Scientific Computing and Imaging Institute 2009 - Present
- Member of student board in the School of Computing, University of Utah 2006 - 2007
- President of the Chinese Student and Scholar Association, University of Utah 2007 - 2008

OTHER ACTIVITIES

- Guest lecturer for the course "Scientific Computing" at University of Utah in 2008- 2010.
- Member of IEEE Computer Society, IEEE Medicine and Biology Society.
- Contributed to Research Grant Proposal: NIH NCRR P41, "Center for Integrative Biomedical Computing".

INVITED TALKS

- **Finite Element Solutions to Inverse Problems in Electrocardiography**
Duke University, July 2012

- **Localizing Myocardial Ischemia by Inversely Computing Transmembrane Potentials**

Utah Biomedical Engineering Conference, September 2011

Conference of IEEE Medicine and Biology Society, August 2011

Applied Inverse Problems Conference, May 2011

International Conference on Bioelectromagnetism, May 2011

- **Variational Regularization for Reconstructing Epicardial Potentials from Body-Surface Mapping** Computing in Cardiology Conference, Sept 2010

- **Finite Element Refinements for Inverse Electrocardiography**

Computing in Cardiology Conference, Sept 2009

- **Finite Element Solution for Inverse Problems in Electrocardiography**

External Advisory Board Meeting of the SCI Institute, University of Utah, September 2007

REFERENCE Available upon Request