

# Jie-Zhi Cheng

Apt. C23, 303 Smith Level Road, Chapel Hill, NC 27516  
310-622-2584

[jiezhicheng@gmail.com](mailto:jiezhicheng@gmail.com)  
[jzcheng@med.unc.edu](mailto:jzcheng@med.unc.edu)

Homepage: <http://www.csie.ntu.edu.tw/~b7506034>

## SUMMARY OF QUALIFICATIONS

- Two journal papers published in Ultrasound in Medicine and Biology, one conference paper published in SPIE Medical Imaging 2008, one conference workshop paper published on MICCAI 2008, one conference paper published on IEEE EMBC'08.
- 11 months internship at Siemens Corporate Research, Princeton, NJ
- More than two years experience working on image segmentation problems especially for 2D and 2D series ultrasound images
- Two years experience in developing a Computer Aided Diagnosis system
- More than three years experience in software engineering

## EDUCATION

### M.S. Biomedical Engineering,

Sep. 2006 – Jul. 2007

National Taiwan University, Taipei, Taiwan (R. O. C.)

Thesis: "Cell-based image segmentation for 2D and 2D series ultrasound images"

Thesis adviser: Dr. C. M. Chen, Institute of Biomedical Engineering, National Taiwan University

Collaboring with Dr. Y. H. Chou, Department of Radiology, Taipei Veterans General Hospital

### B.S. Computer Science and Information Engineering,

Sep. 1998 – Jul. 2002

National Taiwan University, Taipei, Taiwan (R. O. C.)

TOEFL (CBT): 263; Listening 27, Structure/Writing 24, Reading 28

GRE (CBT): 1330; Verbal: 560/800; Quantum: 770/800; AWA: 3.5

## AWARDS/HONORS

- Excellent Master Thesis Award, Institute of Information and Computing Machinery, Taiwan, 2007
- Ministry of Education's Scholarship for Studying Abroad, Ministry of Education, Taiwan  
Acceptance Rate: **17.11%** (Engineering division is more competitive than overall)
- Best poster award, Symposium of Annual Conference of the Biomedical Engineering Society, Taipei, Taiwan, R.O.C., December 15-16 2006.

## RESEARCH INTEREST

Computer Vision, Image Segmentation, Pattern Recognition, Perceptual Grouping, Medical Image Analysis, Spatial-temporal Analysis, Statistical Analysis, Biological-inspired Computer Vision

## SKILLS

**Computer:** C/C++, Matlab, Basic, LISP, PHP, Microsoft .Net, Direct X

**Language:** English, Mandarin (Chinese), Hokkien (Taiwanese)

## ACADEMIC SERVICE

### Reviewer

- Pattern Recognition

## PUBLICATIONS

### Journals

- J. Z. Cheng, Y. H. Chou, C. S. Huang, Y. C. Chang, C. M. Tiu, K. W. Chen, C. M. Chen. "Computer-Aided Diagnosis with Automatic Boundary Delineation for Breast Lesions on sonogram: Effect of Boundary Quality on Performance," accepted for **Radiology**, 2009. (SCI; 2008 Impact Factor 5.996, 5-Year Impact Factor 6.634)
- J. Z. Cheng, C. M. Chen, Y. H. Chou, C. S. K. Chen, C. M. Tiu, K. W. Chen. "Cell-based Two-region Competition Algorithm with A MAP Framework for Boundary Delineation of A Series of 2D Ultrasound Images," Ultrasound in Medicine and Biology, 33(10): pp. 1640-1650, 2007.
- C. M. Chen, Y. H. Chou, C. S. K. Chen, J. Z. Cheng, Y. F. Ou, F. C. Yeh, K. W. Chen. "Cell Competition Algorithm: A New Segmentation Algorithm for Multiple Objects with Irregular Boundaries in Ultrasound Images," Ultrasound in Medicine and Biology, 31(12): pp. 1647-1664, 2005. (SCI; 2005 Impact Factor 2.221). (I'm the **first student** in the author list)

- J. Z. Cheng, C. M. Chen. "Cell-Based Image Segmentation for 2D and 2D Series Ultrasound Images", Institute of Information & Computing Machinery, 11(2): pp. 63-77, 2008. (資訊學會會刊)

#### Conferences

- J. Z. Cheng, E. B. Cole, E. D. Pisano, D. Shen. "Detection of Arterial Calcification in Mammograms by Random Walks." Information Processing in Medical Imaging 2009, Williamsburgh, VA, July 5-10, 2009 (IPMI'09 co-chairs: J. L. Prince, D. L. Pham, K. J. Myers) (*Acceptance Rate: 17%; Oral presentation*).
- F. Shi, P. T. Yap, Y. Fan, J. Z. Cheng, L. Wald, G. Gerig, W. Lin, D. Shen. "Cortical Enhanced Tissue Segmentation of Neonatal Brain MR Images Acquired by a Dedicated Phased Array Coil", CVPR'09 workshop MMBIA, Miami Beach, Florida, June 20th, 2009
- W. Wein, J. Z. Cheng, A. Khamene. "Ultrasound-based Respiratory Motion Tracking in the Abdomen," MICCAI 2008 workshop: IGSTI'08, NYC, NY, USA, Sep. 6-10, 2008. (*Acceptance:12/33; Oral presentation*)
- S. P. Lee, J. Z. Cheng, C. M. Chen, I. W. Y. Tseng. "An automatic segmentation approach for boundary delineation of corpus callosum based on cell competition," IEEE EMBC'08, Vancouver, British Columbia, Canada, Aug. 20-24, 2008. *oral presentation*
- J. Z. Cheng, K. W. Chen, Y. H. Chou, C. M. Chen. "Cell-based image partition and edge grouping: A nearly automatic ultrasound image segmentation algorithm for breast cancer Computer-Aided Diagnosis," SPIE Medical Imaging, San Diego, CA, U.S.A., Feb. 16-21, 2008, *poster presentation*.
- J. Z. Cheng, C. M. Chen, Y. H. Chou. "Cell-based two-region competition algorithm with a MAP framework for boundary delineation of a series of 2D ultrasound images," Symposium of Annual Conference of the Biomedical Engineering Society, Taipei, Taiwan, R.O.C., December 15-16 2006, *poster presentation*. (Best poster award)
- J. Z. Cheng, C. Y. Lee, Y. H. Chou, C. M. Chen. "Regularized cell competition algorithm for boundary delineation in a series of 2D sonograms," EMBC'05- The 3rd European Medical and Biological Engineering Conference, Prague, Czech Republic, November 20-25 2005, *oral presentation*.
- Y. F. Ou, J. Z. Cheng, C. M. Chen. "A septa preserving cell competition algorithm for boundary delineation of sonographic breast lesions," Symposium of Annual Conference of the Biomedical Engineering Society, Tainan, Taiwan, R.O.C., December 17-18 2004, *poster presentation*.

#### Conference Abstracts

- F. Shi, Y. Fang, J. Z. Cheng, L. L. Wald, G. Gerig, W. Lin, D. Shen. "Hybrid Atlas based Tissue Segmentation for Neonatal Brain MRI Acquired Using a Dedicated Phased Array Coil." International Society for Magnetic Resonance in Medicine (ISMRM) 17<sup>th</sup> Annual Meeting & Exhibition 2009 Hawaii, April 18-24, 2009, *poster presentation*
- J. Z. Cheng, Y. H. Chou, C. M. Chen. "A cell-based graph-traversing approach for boundary detection of sonographic breast lesions," The 11<sup>th</sup> Congress of the World Federation for Ultrasound in Medicine & Biology, Seoul, South Korea, May 28-June 1 2006, *poster presentation*.
- C. M. Chen, J. Z. Cheng, K. W. Chen. "A CAD system for sonographic Breast lesions with a nearly automatic segmentation algorithm," Forum on Emerging Biomedical Technologies: 2006 International workshop on CAD, Taipei, Taiwan, Nov. 20-21, 2006.

#### Technical Reports

- C. M. Chen, J. Z. Cheng, Y. H. Chou. "ACCOMP— Augmented Cell Competition Algorithm for Delineating Boundaries of Objects of Interested in Sonography," Institute of Biomedical Engineering, National Taiwan University.

#### Patents

- W. Wein, J. Z. Cheng, A. Khamene. "Ultrasound-based Respiratory Motion Tracking in the Abdomen," U. S. A. Patent Disclosure, Pending
- C. M. Chen, J. Z. Cheng. "Shape-detecting Method and System thereof for A Image of A Tumor," R.O.C. Patent, pending.

#### Working Paper.

- [To be updated]

### WORKING EXPERIENCE

**Research Assistant**, Chapel Hill, NC, USA, Sep. 2008 – Aug. 2009

**Biomedical Research Imaging Center, University of North Carolina-Chapel Hill**

- Breast Arterial Calcification detection on digital mammograms
- DNA fiber tracking to detect the event of mitosis
- Supervisor: Dr. Dinggang Shen

**Internship**, Princeton, NJ, USA, Jul. 2007 – June 2008

**Siemens Corporate Research**

- Respiration motion compensation for image registration
- Accelerate interpolation with Intel MMX/SSE2 instruction sets

- Investigate on Texture filtering approaches like Gabor filters, monogenic signal method, etc.
- Programming, Tools: Visual C++ 2005, Matlab
- Supervisor: Dr. Wolfgang Wein

**Research Assistant**, Taipei, Taiwan, June 2004 – June 2007

**Institute of Biomedical Engineering**, National Taiwan University

- Develop image segmentation algorithms for 2D and 2D series sonography
- Develop a computer aided diagnosis system on breast cancer
- Compose research paper drafts
- Compose a grant proposal for National Science Council. Grant Name: “**3D Computer Aided Diagnosis for Sonographic Breast Lesions and Bias Correction**”
- Review papers, including the topics of 2D/3D image segmentation, perceptual grouping, object tracking
- Programming, Tools: Borland C++
- Supervisor: Dr. Chung-Ming Chen

**Private Tutor**, Taipei, Taiwan, Oct. 2005 – June 2007

- Teach mathematic, physics, and chemistry, for a junior high school student

**Software Engineer/Soldier**, Army, Taiwan, Aug. 2002 – Mar. 2004 (**Compulsory Military Service**)

(1) 34 division, Army, ROC; (2) Operations Simulation Division, Operations and Doctrine Committee, Army General Headquarters

- 6 months soldier training in the 34 division, Army
- 1 year in Army General Headquarters as software engineering
- Develop C4ISR System
- Tools: Microsoft .Net Basic, MySQL, Direct X

**Part Time Student**, Taipei, Taiwan, Sep. 2001 – June 2002

**Computer and Information Networking Center**, National Taiwan University.

- Develop CEIBA (Collaborative enhanced instruction by asynchronous learning) system
- Tools: PHP, MySQL