

TIAN CAO

CONTACT INFORMATION	Department of Computer Science UNC-Chapel Hill Chapel Hill, NC 27599-3175 USA	Mobile: (+1) 919-699-9542 E-mail: tiancao@cs.unc.edu http://tiancao.me/
OBJECTIVE	Full-time R&D position	
INTERESTS	Machine Learning, Image Analysis, Computer Vision	
EDUCATION	University of North Carolina at Chapel Hill , Chapel Hill, NC, USA Ph.D. candidate in Computer Science Sichuan University , Chengdu, Sichuan, China M.S. in Computer Science Sichuan University , Chengdu, Sichuan, China B.E. in Computer Science	08/2010-present 09/2007-06/2010 09/2003-05/2007
EXPERIENCE	Research Assistant, UNC Chapel Hill , Chapel Hill, NC, USA. Multi-modal Dictionary Learning for Sparse Representation <ul style="list-style-type: none">• Developed dictionary learning for multi-modal image prediction, classification and registration.• Learning multi-modal dictionaries based on sparse coding and deep learning architecture, and applied the learned dictionary to simplify the multi-modal image analysis problems.• Applied the algorithm to Correlative Microscope images.• Implemented in VTK, ITK, matlab and C++. Intern, Siemens Corporate Research , Princeton, NJ, USA. Object Detection in Ultrasound Videos <ul style="list-style-type: none">• Developed and implemented a needle detection method for ultrasound videos.• Implemented a 3D steerable filtering method to incorporate spatial and temporal information for needle detection in C++ and MFC.• Incorporated with different features and hough transform to vote the needle segment. Research Assistant, Chinese Academy of Sciences , Shenzhen, China Energy based Crowd Motion Analysis <ul style="list-style-type: none">• Developed an energy based crowd motion analysis algorithm based on mutual information.• Applied the algorithm to detect the crowd abnormal behaviors.• Implemented in OPENCV and C++. Research Assistant, Sichuan University , Chengdu, China Super-resolution for Ultrasound Speckle Reduction <ul style="list-style-type: none">• Developed a fast and robust super-resolution method for intima reconstruction in ultrasound.• Applied anisotropic diffusion to reduce speckle with edge enhancement in image reconstruction.• Implemented anisotropic diffusion method in C++ and GLSL.	09/2010-present 05/2012-08/2012 09/2009-03/2010 01/2008-09/2009
PUBLICATIONS	<p>[1]. Tian Cao, Christopher Zach, Marc Niethammer et al., “Multi-modal Registration for Correlative Microscopy using Image Analogies”, <i>Medical Image Analysis (MedIA)</i>, Elsevier, 2013.</p> <p>[2]. Tian Cao, Vladimir Jovic, Marc Niethammer et al., “Robust Multimodal Dictionary Learning”, <i>The 16th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)</i>, 2013.</p> <p>[3]. Tian Cao, Christopher Zach, Marc Niethammer et al., “Registration for Correlative Microscopy using Image Analogies”, <i>Fifth Workshop on Biomedical Image Registration (WBIR)</i>, 2012.</p>	

- [4].Bo Wang, **Tian Cao**, Yuguo Dai, Dong C. Liu, “Ultrasound Speckle Reduction via Super Resolution and Nonlinear Diffusion”, *the 9th Asian Conference on Computer Vision (ACCV)*, 2009.
- [5].**Tian Cao**, Bo Wang, Dong C. Liu, “Optimized GPU Framework of Semi-implicit AOS Scheme Based Speckle Reducing Nonlinear Diusion”, *proceedings of SPIE Medical Imaging (SPIE MI)*, 2009, Vol. 7259, 2009.
- [6].**Tian Cao**, Chaowei Tan, Dong C. Liu, “Adaptive Curve Region based Motion Estimation and Motion Visualization of Cardiac Ultrasound Imaging”, *the 3rd International Conference on Bioinformatics and Biomedical Engineering (ICBBE)*, Vol. 3, pp. 453-457, 2009.
- [7].**Tian Cao**, Xinyu Wu, Jinnian Guo, Shiqi Yu, Yangsheng Xu, “Abnormal Crowd Motion Analysis”, *IEEE International Conference on Robotics and Biomimetics (ROBIO)*, 2009.

PROFESSIONAL SKILLS

C/C++, Python, Java, Matlab, Bash, ITK, VTK, OPENCV, CUDA, MFC, SQL, GLSL

SELECTED AWARDS

Guanghua Scholarship.	2010
Graduate Student Fellowship, Sichuan University.	2007-2010
Student Innovation Award, Sichuan University.	2005-2007
1st prize of China Undergraduate Mathematical Contest in Modeling.	2006