Chen Minjie

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OBJECTIVE

Have interests on algorithm research and development related to image processing, computer vision, pattern recognition, machine learning, data mining and data compression.

EDUCATION

Doctorate in Computer Science, University of Eastern Finland

Supervisor: Pasi Fränti. Thesis is passed with distinction (<10%).Opponent: Susanto Rahardja

M.Eng. in Biomedical Engineering, Shanghai Jiao Tong University

B.Eng. in Biomedical Engineering, Shanghai Jiao Tong University

KEY QUALIFICATIONS

- Research experience (>5 years) in digital image processing, analysis, especially in the image denoising and medical images (x-ray, MRI) post-processing (enhancement)
- Research experience in spatial-temporal data analysis and compression, e.g. the simplification, compression and activity analysis of time series data (GPS trajectories)
- Research experience in computer-aided diagnosis of medical images (e.g. nodule detection in Chest x-ray), medical products and medical application development
- Research experience of computer vision and computational photography algorithms, e.g. demosaicing, denoising, enhancement, auto white balance, deblurring, image alignment, feature matching, panorama and HDR.
- Research experience on human machine interaction application, e.g. head pose estimation and tracking, gaze estimation.
- Good publication record (first author publication on IEEE T-MM, IEEE T-IP, DCC, ICIP, ICME, ICPR …), one issued and two filed patents
- Knowledge background in computer vision, computational photography, pattern recognition and machine learning, medical image analysis, statistical signal processing, computational geometry, data compression, information theory, HDR imaging, data mining and inference algorithm.
- Quick learner with strong problem-solving and trouble-shooting skills
- Success-driven and result-oriented team player who continually meets and exceeds goals and expectations

COMPUTER SKILLS

- Programming languages: C++, MATLAB

AWARD & GRANT

Nokia Scholarship, 2011 (incentive grant), topic: "Compression of GPS Trajectories"

Nokia Scholarship, 2010 (incentive grant), topic: "Statistical Method for Image Denoising and Compression"

Tekniikan edistämissäätiö (TES), 2011(full year grant)

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EXPERIENCES

Spreadtrum Comm., Shanghai.

Multimedia System Engineer. 2012.11-

Algorithm research on computational photography and computer vision (image demosaicing, restoration and enhancement, panorama stitching).

Design and implement panorama stitching algorithm (Matlab, C) for mobile phone.

Design algorithm for joint denoising, demosaicing and enhancement.

Design algorithm for head pose estimation and tracking.

Design algorithm for eye-tracking and eye center estimation.

University of Eastern Finland

PhD candidate and Researcher in computer science. 2008.8- 2012.9

Good publication record during the PhD study, two first author regular transactions paper (IEEE T-MM, IEEE T-IP), and eight first author conference paper (DCC, 3xICIP, ICPRx2, ICME, ICGCS)

I also designed and implemented several algorithms which are already used in MOPSI project.

I have finished following algorithm design and code implementation (matlab or C++ code).

Image Denoising Algorithm for Raster Map Images

Propose statistical denoising algorithms for raster map images (image denoising with limited color output).

Compression and simplification of GPS trajectories

Propose algorithms compression algorithm for vector data and GPS trajectories (time series data with time, latitude and longitude information).

Propose fast algorithm for GPS trajectory simplification.

Route Analysis Algorithm in MOPSI project

Human activity analysis of GPS trajectories.

Time-schedule based bus search.

Similarity search of GPS data.

Others

Bit-plane coding, image enhancement and image binarization algorithm.

Visit signal processing group in I2R Singapore on July 2010. Cooperation on HDR image denoising.

CareStreamHealth Global R&D center (Kodak Health Group Global R&D Center)

Image Processing Researcher 2007.3- 2008.6.   **Intern** 2005.7- 2007.3

Computer-aided diagnosis, medical image post-processing and analysis.

Three filed US patents, one is issued.

The demos are shown on RSNA 2006, 2007 and 2008.

- ICU CAD（Intensity Care Unit Computer Aided Diagnosis, Supervisor: Zhimin Huo, Rochester. N.Y.)

  Preprocessing algorithm for multiple raw x-ray images.

  Local enhancement algorithm for x-ray images.

  Medical devices detection in x-ray images, such as ET (Endotracheal Tube), FT (Feeding Tube) and NT (Nasogastric Tube).

- Chest CAD (Chest X-ray image Computer Aided Diagnosis, Supervisor Mantao Xu, Shanghai)

  Enhancement and normalization algorithm for DR images nodule detection, better performance in CAD system.

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Fast algorithm using IPP (Integrated Performance Primitives) in features selection (Gabor and shape features).

- MRI Mammo-CAD algorithm research (Supervisor: Zhimin Huo, Rochester. N.Y.)
  Tumor auto-detection and benign-malignant classification for MRI Mammo-CAD system.

Software Quality Engineer for medical equipment, Intern   2005.1-2005.6
  Software tester on CR and DR equipment.

RELATED COURSES
- Bachelor Courses:

Microcomputer theory and interface, Database System, Computer organization and architecture, Digital Image Processing, Signal and System, Digital Signal Processing, Circuitry, Automatic Control System, Analogical & Digital Electronics etc.
- Master Courses:

Random Signal Processing, System Identification, Computer Network, Probability and Statistics, Theory of Matrices. Physical therapy technique and clinical application, English for science and technology, Transducers for biomedical measurements, Adaptive filtering, 3D Image Processing and Visualization, Bioinformatics.
- PhD Courses:

Statistical Inference, Clustering Method, Bayesian Inference, Advanced Digital Speech Processing, Pattern Recognition, Image Analysis, Design and Analysis of Algorithms.

JOURNAL
1. **M. Chen**, M. Xu, P. Fränti, "A Fast $O(N)$ Multi-resolution Polygonal Approximation Algorithm for GPS Trajectory Simplification", *IEEE Trans. on Image Processing*, 21(5), 2770 – 2785, May, 2012.
2. **M. Chen**, M. Xu, P. Fränti, "Adaptive Context-tree based Statistical Filtering of Raster Map Images Denoising", *IEEE Trans. on Multimedia*, 13(6), 1195-1207, December, 2011.

PATENTS
3. Z. Huo, **M. Chen**, J. Zhang, D. Foos, "Enhancement of region of interest of radiological image", US Patent Application No. 12/333,031, Filed Nov 20, 2007.
4. Z. Huo, J. Zhang, **M. Chen**, "Image Analysis of Tube Tip Positioning", US Patent Application No. 11/942,021, Filed Nov 19, 2007.
5. Z. Huo, **M. Chen**, "ROI-Based Rendering for Diagnostic Image Consistency" US Patent No. 8150110.

CONFERENCE
6. K. Waga, A. Tabarcea, **M. Chen**, P. Fränti, "Detecting movement type by route segmentation and classification ", *CollaborateCom*, 508-513, 2012.
7. **M. Chen**, M. Xu, P. Fränti, "Compression of GPS Trajectories using optimized approximation", *IEEE Int. Conf. on Pattern Recognition* (ICPR'12), 3180-3183, 2012.
8. **M. Chen**, M. Xu, P. Fränti, "Compression of GPS Trajectories", *Data Compression Conference* (DCC'12), 62-71, Snowbird, USA, 2012 (oral)* (rank A+ conference in computer science).
9. **M. Chen**, M. Xu, P. Fränti, "Adaptive Filtering of Raster Map Images Using Optimal Context Selection", *IEEE Int. Conf. on Image Processing* (ICIP'11), 77-80, Brussels, Belgium, 2011.(oral)
10. **M. Chen**, M. Xu and P. Fränti, "Fast dynamic quantization algorithm for vector map compression", *IEEE Int. Conf. on Image Processing* (ICIP'10), Hong Kong, China, 4289-4292, September 2010. (oral)
11. **M. Chen**, M. Xu and P. Fränti, "Optimized entropy-constrained vector quantization of lossy vector map compression", *IEEE Int. Conf. on Pattern Recognition* (ICPR'10), Istanbul, Turkey, 722-725, August 2010.

12. **M. Chen**, M. Xu and P. Fränti, "Statistical filtering of raster map images", *IEEE Int. Conf. on Multimedia & Expo* (ICME'10), Singapore, 394-399, July 2010. (oral, 15%)

13. W. Tian, **M. Chen**, M. Xu, P. Fränti and H. Wang, "Image denoising using context quantization and local linear regression", *Int. Conf. Green Circuits and Systems* (ICGCS'10), Shanghai, China, 451-456, June 2010.

14. **M. Chen**, P. Fränti and M. Xu, "Lossless bit-plane compression of images with context tree modeling", *Int. Conf. Green Circuits and Systems* (ICGCS'10), Shanghai, China, 605-610, June 2010.

15. **M. Chen,** M. Xu and P. Fränti, "Multi-layer filtering approach for map images", *IEEE Int. Conf. on Image Processing* (ICIP'09)*,* Cairo, Egypt, 3953-3956, November 2009.

16. Z. Huo, S. Li, **M. Chen**, J. Wandtke, "Computer-Aided Interpretation of ICU Portable Chest Images: Detection of Endo-Tracheal Tubes", *SPIE Conf. on Medical Imaging*, San Diego, CA, USA, Proc. SPIE, Vol. 6915, 69152J, Feb 2008.

17. **M. Chen**, Z. Huo, J. Wandtke, D. Yankelevitz, C. Henschke, D. Foos, "Computer-Aided Interpretation of Intensive Care Unit (ICU) Images: A Consistent Image-Rendering Method for Comparison of Multiple Chest Radiographs", *IEEE Int. Conf. on Complex Medical Engineering* (CME2007), Beijing, China, 622-625, 2007.