Curriculum Vitae

Tong Yubing

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Profile:

Over 5 years academic and industrial experience in video & image processing and machine vision; employing a wide variety of signal processing, visual perception computing, machine learning and high performance & parallel computing methods oriented large scale data in multimedia indexing.

- Excellent communication & teamwork skills
- Experience in project development and execution
- Strong publication record in conferences & journals

Education:

Sep 2002–Jan 2007 **PhD**. in electrical engineering with concentration on communication & information system
Department of Electronics and Information Engineering
Beihang University, Beijing, China
Dissertation: Study of Image Quality and H.264 Video Coding Technology

Sep 1999–Jul 2002 **M.S** in electrical engineering with concentration on pattern recognition & intelligent system
Department of Electronics and Information Engineering
Wuyi University, Guangdong, China
Thesis: Fuzzy Frequency Convertible Controller for Intelligent Home Appliances

Research and working experience:

Jan 2010~Dec 2010
CNRS(Centre National de la Recherche Scientifique) / UJF(University Joseph Fourier, France): Postdoctoral research fellow in CNRS/UJF/MRIM group which has been involved in Quaero project, a broad pan-European collaborative research program for developing multimedia, multilingual indexing and management tools.
My work is mainly on parallel learning for multimedia indexing:

- Image indexing based on incremental active learning, multiple SVM and new descriptors
- Collaboration with other groups in LIG/UJF and parallel optimization on their previous algorithm: including GETALP (in audio processing), Gpig (in motion analysis) and MESCAL (in parallel programming) for multimedia indexing
- High performance and parallel program development on **Grid5000** (***France National Grid Platform***): Parallel incremental multi-classifier learning algorithm oriented large scale imbalanced data
- Image annotation and evaluation in **NIST/TRECVID 2010** and **VOC2010 Challenge**
- Grid5000 Spring School 2010 in Lille, France

Jan 2009~Dec 2009
CNRS/ UJM (Université Jean Monnet / Université de Lyon, France): Postdoctoral research fellow on computer vision in Lab. Hubert Curien
My work is about video & image saliency detection and extending application in image quality analysis, video tracking and salient event detecting in surveillance, more in details as follows,

- Video & Image saliency detection system, including:
  - Video motion saliency detection with probability density function method: phase histogram distribution analysis on the spatial/ temporal coherence of motion vector field
  - Scale space theory in image saliency detection with multi-scale Gaussian pyramid on color, intensity and orientation feature conspicuity analysis
  - Robust face detection based on the statistic distribution of skin color
- Set up eye gaze map database through subjective experiments with an eye tracker device
- Extending application of saliency map
  - Background extraction for video surveillance sequences
  - Video IOR (Interest of Region) detection based on saliency map and motion analysis
  - Image quality assessment based on saliency map and extreme points detection
  - Eye movement tracking with saliency analysis

Nov 2006~Dec 2008
Arcsoft Co., Ltd, Shanghai. (Multimedia solutions provider for Nokia, Samsung, Motorola, LG): Video software engineer and Development Project Manager
- MPEG4 AVC/H.264 video codec optimization
  - Video algorithm optimization on intra prediction, ME, RDO, float point to fix point transform
  - More slices coding for error resilience coding
  - Enhanced rate control with scene detection
  - High effective C programming with performance optimization and memory usage
- Intel vTune performance profiling and optimization with SIMD oriented 32 bit platform WMMX and ARM
- Project development flow including request analysis design, start, codec, delivery, milestone and α , β , release version control etc.

Jan 2006~Oct 2006
Beihang Institute of Unmanned Aircraft &Vehicle Technology, (Beijing): Leader of the cooperation project on video compressing system
- H.264 video compressing system on ADSP/Blackfin561
  - Video & Image Capture with PPI and DMA
  - H.264 encoder algorithm optimization on intra prediction and ME
  - Dual-core DSP programming design in multi-thread mode and optimization with multimedia assembly instruction, usage of the memory on chip
  - Re-arrangement of data and pipeline
  - Debug program with JTAG DSP emulator and simulator in Vdsp++4.5

Jul 2004~Dec 2005
Electrical System Lab in Beihang University (China):
- **Linux device driver developer**
  - Linux device driver development for the embedded CCD camera in **the cooperation project** between University and **Motorola "**MPEG-4 video surveillance system based on i.MXL**."**
- **Image processing and perception**
  - A multi-parameter hierarchical image quality assessing model based on regressing analysis
  - An image and video quality assessing model based on neural network and support vector machine
  - Subjective experiments for MOS according to 5-level scale in DSCQS mode
  - Extending research on signal sparse reconstruction: Wavelet kernel support vector machines for enhanced sparse approximation
- **Still image compressing & identification**
  - Fingerprint and face image compression with spline wavelet
  - Document image compressing based on image content analyzing and feature extracting
  - Design USB Fingerprint Capturing Device With FPS200 sensor
  - Fast fingerprint classification algorithm based on oriented radial and generalized nonsymmetrical features

Jan 2004~Jun 2004
Lenovo Academe / Lonovo Corp.（Beijing）: Intern on MPEG2 software engineer
- Parse the syntax and semantics of MPEG2 audio, video and system layer

- MPEG2 audio and video element stream were integrated into PS (program stream) and TS (transfer stream)

Skills:

- Over 5 years academic and industrial experience in image processing, video compressing and computer vision, especially image & video quality assessment, video codec optimization and saliency detection
- Proficient at visual attention models analyzing, visual object detecting & tracking methods based on low-level features and multi-scale space theory
- Proficient at MPEG2/MPEG4 AVC/H.264 standards and common optimization methods
- Proficient at machine learning techniques and statistic theory including neural network, fuzzy logic, support vector machines, active learning
- Proficient at C/C++/matlab and VS2005/VS2008 programming and performance optimization & memory usage with deep knowledge on C high effective programming, data structure and algorithm analysis
- Proficient at Intel VTune Profiling and debugging with emulator and simulator including ADSP/vdsp4.5++ and ARM/ADS1.2
- Familiar with ADSP and ARM system development especially assembly optimization and cache usage
- Familiar with Linux and Linux device drive development
- Familiar with toolbox and open source including OpenCV in face detection and video tracking, WEKA, MPEG4 and MPEG7 open sources
- Familiar with Unix shell/bash, awk, perl programming and application development oriented grid platform
- Familiar with tortoise SVN version control tool
- Familiar with multi-thread and multi-core programming（Pthreads and OpenMP in VS2005）
- Knowing GPU and OpenGL and corresponding view transformation, project transformation and texture map etc.
- Learned lessons: probability, random variables and stochastic process; signal estimation and detection theory; wavelet; metric theory and optimization theory

Special skills & others:

- Good experience in project development, execution and team work
- Strong presentation and communication skills with publication record in major journals and conferences
- High energy, self-motivated
- Experience in giving lessons of Fourier frequency filter and image restoration to CIMET/EU master students
- Experience in supervising students coursework and research levels
- As participant and organizer of CCIW2009, ST. Etienne and IEEE CBMI2010, Grenoble, France
- Primary knowledge of French with some lessons in CILEC language school in S.T. Etienne, France and with willingness to learn more.

Honors and Awards:

- Air Bus Corp. Fellowship 2005 Beihang University.
- Excellent Doctoral Candidate Scholarship, Beihang University 2003.
- Excellent Master Candidate Scholarship, Wuyi University, 2001.

Recent publication list:

Tong Yubing, Fahad Fazal Elahi Guraya,Faouzi Alaya Cheikh, Hubert Konik and Alain Tremeau. A Visual Saliency Model for Perception-based Video Surveillance (submitted to Journal of Cognitive Computing 2010, Springer/ in Modification)

Bahjat Safadi, Georges Quénot and Yubing Tong. Incremental learning for active learning based Multi-learners

for image indexing (Accepted by MMM2011/Multimedia Modeling).

Tong Yubing, Bahjat Safadi, Georges Quénot. Incremental Multi-Classifier Learning Algorithm on Grid5000 for Large Scale Image Annotation (Accepted by ACM MM'10).

Tong Yubing, Hubert Konik and Alain Tremeau. Color Face-Tuned Salient detection For Image Quality Assessment (EUVIP 2010/ **Invited paper)**

Fahad Fazal Elahi Guraya, Faouzi Alaya Cheikh, Alain Tremeau, Yubing Tong and Hubert Konik. Predictive Saliency Maps for Surveillance Videos (DCABES 2010/Accepted)

Yubing Tong, Hubert Konik, Faouzi Alaya Cheikh, Fahad Fazal Elahi Guraya and Alain Tremeau. Multi-Feature based visual saliency detection in surveillance video (VCIP2010/Accepted)

Fahad Fazal Elahi Guraya, Ali Shariq Imran, Yubing Tong, Faouzi Alaya Cheikh. A Non-reference Quality Metric Based on Visal Attention Model for Videos (ISSPA2010/Accepted)

Yubing Tong, Faouzi Alaya Cheikh, Hubert Konik and Alain Tremeau. Full reference image quality assessment based on saliency map analysis (International Journal of Imaging Science and Technology, Volume 54, Number 3, Pages 030503, IST, 2010)

Tong Yubing, Zhang Qishan. Image quality assessing model by using neural network and support vector machine. Journal of Beijing University of Aeronautics and Astronautics, v32, n9, September, 2006, P1031-1034

Ding Wenrui, Tong Yubing and Zhang Qishan. Image and Video Quality Assessment Using Neural Network and SVM, Tsinghua Science and Technology, v16, n1, 2008, 112-116

Y.B.Tong, D.K.Yang, Q.S.Zhang. Wavelet Kernel Support Vector Machines for Sparse Approximation，Journal of Electronics (China) , v23, n4, 2006, 539-542

Y.B.Tong, Q.S.Zhang. Image Quality Assessing Model Based on PSNR and SSIM, Journal of Image & Graphics, v11, n12, 2006, 1758-1763

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Qing.Chang, Yubing Tong, Qishan Zhang. Video quality assessing model based on single image quality with different weights, Journal of Beijing University of Aeronautics and Astronautics, 2007.33(3)

Tong Yubing, Zhang Qishan. Multi-parameter hierarchical image quality assessing model based on regressing analysis, 2006 Aeronautics & Astronautics Science & Technology Doctoral Forum of China

Tong Yubing, Chang Qing, Zhang Qishan. Fast fingerprint classification algorithm based on oriented radial and generalized nonsymmetrical features. Computer Applications, 2005.Vo.25.No.6, 1307-1309

Yubing Tong, Qing Chang, Qishan Zhang, Patterns of SVM in Digital Watermarking, Application Research of Computers, 2005.Vo.22.No.3, 147-149

Yubing Tong, Qing Chang, Qishan Zhang, Document Image Compressing Algorithm Based on Image Content Analyzed and Features Extracted, Radio Engineering of China, 2004, Vol.34, No.11, 8-10

Y.B.Tong, Q.Chang, Q.S.Zhang. Embedded System of CCD Video & Image Capturing, Optics and Electronics Engineering, 2004.12.Vol.31, 133-136

Yuan Xiaoyu, Tong Yubing. PKI Architecture in Fingerprint Identification Application, Information Security and Communication Secrecy, 2004.11, 37-39

Tong Yubing, Wu Jinpei. Fuzzy Control of Household Washing Machines Based on Frequency Conversion Technology. Journal of Wuyi University, 2002.Vol.16.No.2, 52-57

Tong Yubing, Wu Jinpei. Fuzzy Control and Frequency Conversion Technique in Washing Machine Based on MC68332 Single chip. Computer Measurement & Control, 2002, Vol.10.No.10, 664-667

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Liu Li, Tong Yubing, Chang Qing. H.264 Video Compressing System Based on ADSP-BF561. Aero-society 11th and electric-society 4th Conference of DSP Application, China

Y.B.Tong，Q.Chang, Q.S.Zhang. Image Quality Assessing by Using Neural Network and Support Vector Machines. The 5th International Conference on Machine Learning and Cybernetics, IEEE, Dalian, China, 2006.8,Vol7:3987-3990

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Y.B.Tong, Q.S.Zhang. Research of Embedded CCD Video & Image Capturing Technique, Proceeding of Chinese Electronics & Information Annual, 2004, Vol.B, 664-668

Tong Yubing, Wu Jinpei. Control system network: DCS, FCS& Field bus intelligent instruments, 6th Industrial system application conference, Shanxi, 2000.7, 106-109.

References

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