South China University of Technology *Carnegie Mellon University*

Zhifeng Wang

Address: Room424, 6th Dormitory for Graduate Students, SCUT, Guangzhou, 510640
Email: novawzf@cs.cmu.edu / wang.zf01@mail.scut.edu.cn
Homepage: http://www.cs.cmu.edu/~novawzf/
Birth: 1985-02-28 **Phone:** 136 4260 4487

EDUCATION

- **2011.9~2012.9** **Joint Ph.D Student: Carnegie Mellon University,** Pittsburgh, Pennsylvania USA
  School of Computer Science (Top 1 in the USA), Advisor: Prof. Alexander I. Rudnicky
- **2009.9~present** **Ph.D Student: South China University of Technology**
  Major: Signal and Information Processing, Ph.D. Advisor: Prof. Qianhua He
  Overall GPA: 3.95 Major GPA: 4.00 Top 1%
- **2008.9~2009.6** **Master Student: South China University of Technology**
  Major: Signal and Information Processing, Master Advisor: Prof. Tusheng Lin
  Overall GPA: 3.71 Major GPA: 3.94 Top 5%
- **2004.9~2008.6** **Bachelor: China University of Geosciences (Wuhan)**
  Major: Electronic and Information Engineering, Bachelor
  Overall GPA: 3.75 Major GPA: 3.97 Top 1%

RESEARCH INTEREST

Speech Signal Processing, HCI, Digital Forensic, Machine Learning and Pattern Recognition

SCHOLARSHIP & HONORS

- 2011 Oversea Study Program of Guangzhou Elite Project Scholarship: 164 thousand yuan
- 2011 The Best Paper Reward of ICMLC2011
- 2009~2012 The first grade scholarship for Ph.D program in SCUT
- 2008 The first grade scholarship for Master program in SCUT
- 2007 Second prize of the “National Undergraduate Electronics Design Contest”
- 2007 Winning prize of the “Special Talent Student”
- 2007 Scholarship for Creative Research: 8 thousand yuan
- 2006 Winning prize of the “Outstanding student leaders in CUG”
- 2005 First grade of National scholarship
- 2005 Second prize of the “National Undergraduate Electronics Design Contest”
- 2004~2008 First grade scholarship of Undergraduate student, 8 times
- 2005 Winning prize of the “Outstanding student leaders in CUG”

RESEARCH EXPERIENCE

- **2010.1~present: Multimedia Information Retrieval Technology, National Natural Science Foundation（60972132）**
  Project Introduction: Exploration and research of content-based multimedia information retrieval technology
  - Involved in the design of multimedia information retrieval database, collection and collation
  - Design cells tree-based multimedia indexing techniques; Explore the theory and methods to improve the performance of algorithms applied to the system
  - Participate in multi-modal information fusion for multimedia signal; Full use of various information, design the

feature level, the model level and decision level of the multi-modal fusion algorithms

- Improve the colloquial speech recognition algorithm in a noisy environment
- Implement the feature level multimodal information fusion using Sphinx3 platform, and apply it to the actual system

➢ **2012.1~present: Acoustic event detection and speaker analysis in the conference speech, National Natural Science Foundation（61101160）**

Project Introduction: Exploration and research conference speech retrieval and semantic analysis

- Theoretical research work in speech segmentation and classification algorithms
- Explore the theory of key speech segments
- Detection and separation of overlapping speech events
- Comprehensive utilization of the information of meeting speech, meeting voice semantics, extract the emotional state of the speaker, speaking style, the atmosphere of the scene, topic extraction
- Research and explore the speaker segmentation algorithm

➢ **2011.9~2012.8: Cobot – the smart interactive robot project, The American natural Fund project**

Project Introduction: Building the robot able to communicate with human in natural language, and choose the topic for the interaction through the perception of human emotional information

- Establish the acoustic model and the language model of the system by a large number of natural language database
- Acoustic models and language models adaptation algorithms for specific user
- Design the human-machine dialogue system on Cobot using Olympus platform
- Emotional information detection algorithm using multiple information from speech and face emotional information

➢ **2008.9-2009.12: The detection of non-speech event in natural speech and its effect on the speech recognition, National Natural Science Foundation（60572141）**

Project Introduction: Explore and study the detection of the non-speech event in the natural speech and improve the ASR rate through speech event classification algorithm

- Involved in the detection of non-speech event algorithm
- Participate in the research of overlapping speech event detection algorithm
- Improve the detection accuracy by Spectral Stability

➢ **2009.9~present: Voiceprint authentication system and its security issues, LAB Project**

Project Introduction: Study various security issues of voiceprint authentication system and design effective anti-attack algorithms

- Build up the Authentic and Playback Speech Database, Chinese Linguistic Data Consortium Data Number: CLDC-2012-003, including 40 speakers
- Generation model of the authentic speech and playback speech; Extract channel pattern noise
- Extract the distinguishing features of the authentic speech and playback speech based on channel pattern noise.

➢ **2011.11-2012.7: BABEL - The multilingual language understanding and recognition project, U.S. Department of Defense project**

Project Introduction: Large vocabulary speech recognition in complex environment

- Establishment of language identification algorithm based on HMM
- Building the acoustic model and language model of Cantonese
- Explore the theory of new features MVDR, and its application for Cantonese speech recognition

➢ **2012.4-2012.7: BOLT - Dialogue intelligent machine translation project, The American natural Fund project**

Project Introduction: Machine translation in human-computer dialogue system

- Building class based language model for BOLT system
- Design the Human-computer dialogue system on BOLT system

- **2011.9-2012.9: The KINECT intelligent human-computer interaction project, Cooperation with Microsoft**

  Project Introduction: Intelligent human-computer interaction systems on Microsoft KINECT platform
  - Using Chirp signal works out the channel response of KINECT
  - Adding KINECT channel response to the training data to achieve the acoustical model of KINECT
  - The MMIE training on SPHINX3 platform, LDA dimensionality and MLLR and MAP adaptation

- **2010.9-2011.9: Multi-modal identity authentication in complex environment, LAB project**

  Project Introduction: Research fusion algorithm based on the voiceprint and face recognition, multi-modal authentication
  - Involved in the design and collection of the database
  - Do research work on the theory of model fusion algorithms

- **2009.9-2011.9: Audio and video visual speech recognition system on Vehicles , LAB project**

  Project Introduction: Multi-modal speech recognition in the noisy environment
  - Involved in the design and collection of the database
  - Overall design and planning of the real-time system, and model training, online and offline recognition
  - Implementation of the model fusion algorithms in the system

PUBLICATION

[1] **Zhifeng Wang**, Gang Wei, Qianhua He. Channel Pattern Noise Based Playback Attack Detection Algorithm for Speaker Recognition [C]. 2011 International Conference on Machine Learning and Cybernetics, 2011, 4: 1708-1713. (**EI: 20114514487212，Best Paper Reward**)

[2] **Zhifeng Wang**, Qianhua He, et.al. Playback attack detection based on channel pattern noise [J]. Journal of South China University of Technology (Natural Science), 2011, 39(10):7-12. (**EI: 20114914584448**)

[3] **Zhifeng Wang**, Yanxiong Li, et.al. A GMM-UBM based recording device identification algorithm. 2011 IEEE International Conference on Intelligent Computing and Intelligent Systems, 2011, 10: 1232-1236. (**EI: 20114513487213，Session Chair**)

[4] **Zhifeng Wang**, Tusheng lin. The programmable filter design of embedded system based on uC/OS-Ⅱ[C]. Proceedings of the 2008 SCUTPSEIS. 2008: 220-225. (**Best Paper Reward**)

[5] Jun He, Qianhua He, **Zhifeng Wang**, et.al. Dynamic speaker clustering algorithm based on minimal GMM distance tracing [C]. 2011 IEEE International Conference on Cyber Technology in Automation, Control, and Intelligent Systems. 2011: 51-56. (**EI: 20113914379166**)

[6] Qianhua He, Jun He, Yanxiong Li, **Zhifeng Wang.** Detection algorithm of pathological continuous speech based on correlation dimension [J]. Journal of South China University of Technology (Natural Science), 40(6):1-5, (**EI: 20123515381791**)

[7] Yanxiong Li, Qianhua He, Wei Li, **Zhifeng Wang.** Two-level Approach for Detecting Non-lexical Audio Events in Spontaneous Speech [C]. 2010 International Conference on Audio, Language and Image Processing. 2010: 771-777. (**EI: 20110713662857**)

[8] Qianhua He, Zhifeng Wang, Zhuosheng Su. Physical Attack to Speaker Authentication System and Its Solutions [J]. (Accepted)

[9] **Zhifeng Wang**, Qianhua He, Jesse J. Jin, Alexander I. Rudnicky. Channel Pattern Noise Based Playback Attack Detection Algorithm for Speaker Verification [J], **IEEE Transactions on Audio, Speech, and Language Processing**. (Submited，returned for reversion)

[10] **Zhifeng Wang**, Qianhua He, et.al. GMM-UBM Based Recording Device Identification [J]. Chinese Journal of Electronics (submited, Peer review)

[11] **Zhifeng Wang**, Alexander I. Rudnicky, Qianhua He. Global Channel Transformation Algorithm for Robust Speech Recognition [J]. (Finished，Ready to submit to Journal of Speech Communication)

[12] Qianhua He, Zhifeng Wang, et.al. Recording Device Identification Algorithm Based on Improved PNCC [J]. (Finished，Ready to submit to Chinese Journal of Electronics)

PATENT

[1] Qianhua He, Zhifeng Wang, et.al. A Channel Pattern Noise Based Playback Attack Detection Algorithm and System. No. 201110330598.7

[2] Qianhua He, Zhifeng Wang, et.al. An Automatic Recording Device Identification Algorithms and System. No. 201110330527.7

WORK EXPERIENCE / COMMUNITY ACTIVITIES

- Served as an organization leader in 09 Bo Party Branch in SCUT: organized a number of learning activities
- Served as a publicity leader in 08 Shuo Party Branch in SCUT: finished all publicity work
- Internships: Wuhan Branch of China Mobile, served as network operation and maintenance
- Served as Vice-Chairman of Chinese Geology University Students' Union: organizing various activities

ENGLISH AND COMPUTER SKILLS

- Passed CET6 in 2006, Passed CET4 in 2005, Have stayed in the USA for one year and good at English listening, speaking, reading and writing.
- Familiar with Windows, Linux and Mac OSX; Passed the third grade of computer network; Familiar with Database;
- Familiar with C, C++, Matlab, Python, Perl, Java, Shell, VHDL

PROFILES

- Open-minded, self-motivated, responsible and precise for the promise, optimistic
- Good fast study skills, can learn new knowledge for a project in a short time
- Good communication skills, cooperation ability, teamwork spirit to work together; good ability of organization to achieve goals