



# CSLT ASR ANNUAL REPORT

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- **Annual report**
- **2015 plan**
- **Culture construction**



## **What we achieve in 2014**

# Group building



## ○ **Two groups formed**

6 engineers: ZZY,LR,ZMY,WXX,LTY,ZXW

2 collaborative engineers: HB,XHB

1 master student: LC

1 collaborative student: YS

6 visiting students: YB,ZDX,LYY,ZXY,CL,WM

# Group building



## ○ Regulation setup

Weekly meetings

weekly discussions

Weekly status report

Bi-monthly individual report

Tri-monthly group report

Intern regulations

# Group building



## ○ **Team building**

Liu Rong and Xue Wei take responsibility

Beidaihe autumn event

Yuanmingyuan spring event

# Individual development



- **Liu Rong graduated and joined Puqiang and Huilan**
- **Yi Shi got offer from Huawei**
- **Liu Chao started his master thesis**
- **Xue Wei graduated and joined the team**
- **Ma Xi graduated and finished master entrance exam**
- **Xue Chen went back to Huilan**
- **Zhao Fang kicked off her global travel**
- **Xiaoxi married**
- **Xiaobai started his mater study in the US**
- **Xiao Meng graduated and married**
- **Rayila and Mahpirat graduated and became teachers**
- **...**

# Collaboration



- **Visiting professor: Nick Evans, Mijiti, Yi Li**
- **Attending conference: ISCSLP, Interspeech, APSIPA, PCCC, ChinaSIP**
- **Collaboration with Chongqing Science and Technology University, and China Academy of Science, Chengdu**
- **Collaboration with Xinjiang U.**
- **Collaboration with Sinovoice, Puqiang, Huilan, D-Ear**
- **AI cloud research center established**



# Research achievements



## ○ Deep learning

DNN structure: various activation function, multi-lingual structure, CNN, RNN

Quick training, online learning rate adjustment

Noise robust approaches: sparse approach, DAE, noise training, echo cancelation, music removal

DNN decoder

Network visualization

VAD

DNN and speaker recognition

# Research achievements



- **Commercial LVCSR system**

  - Data accumulation

  - Server side ASR AM and LM, 10 million active users

  - Embedded ASR system

- **Speaker recognition**

  - Factorization-based speaker recognition

  - DNN-based speaker recognition

  - Robust speaker recognition: emotion, clipping

- **Language ID**

- **Emotion detection**

- **Speech synthesis**

# Research achievement



- **Word and knowledge embedding**

  - WV-based classification

  - Sphere WV

  - Multi-lingual transfer

  - Knowledge vector

- **Translation**

  - Demo ready

- **Question and answering**

  - Fussy match

  - System design

# Research achievement



## ○ Paper publication: Published already (1 SCI journal, 10 EI conf)

Shi Yin, Chao Liu, Zhiyong Zhang, Yiye Lin, Dong Wang, Javier Tejedor, Thomas Fang Zheng, Yinguo Li, "Noisy Training for Deep Neural Networks in Speech Recognition", EURASIP ASM, to appear [pdf]

Xuwei Zhang, Yiye Lin, Dong Wang, "LASSO-BASED REVERBERATION SUPPRESSION IN AUTOMATIC SPEECH RECOGNITION", ICASSP 2015.

Jun Wang, Dong Wang, Ziwei Zhu, Thomas Fang Zheng, Frank Soong, Discriminative Scoring for Speaker Recognition Based on I-vectors, APSIPA 2014.

Chao Xing, Dong Wang, Xuwei Zhang, Chao Liu, document classification based on i-vector distributions, APSIPA 2014.

Javier Tejedor, Doroteo T. Toledano, and Dong Wang, ATVS-CSLT-HCTLab System for NIST 2013 Open Keyword Search Evaluation, IberSPEECH 2014, LLNCS/LNAI Proceedings.

Jun Wang, Lantian Li, Dong Wang, Thomas Fang Zheng, Research on generalization property of time-varying Fbank-weighted MFCC for i-vector based speaker verification, ISCSLP 2014 (in Chinese)

Fanghu Bie, Dong Wang, Thomas Fang Zheng, Truncated speech for speaker recognition, ISCSLP 2014 (in Chinese)

Rong Liu, Dong Wang, Chao Xing, Document classification based on word vectors, ISCSLP 2014 (in Chinese).

Chao Liu, Dong Wang, Zhiyong Zhang, "Pruning Deep Neural Networks by Optimal Brain Damage", Interspeech 2014.

Fanhu Bie, Jun Wang, Dong Wang, Thomas Fang Zheng, "BLOCK-WISE TRAINING FOR I-VECTOR", ChinaSIP 2014

Xiangtao Meng, Chao Liu, Zhiyong Zhang, Dong Wang, "NOISY TRAINING FOR DEEP NEURAL NETWORKS", ChinaSIP2014.

# Research achievement



- **Papers submitted already: 3 SCI journal, 1 conf**

1. Jun Wang, Dong Wang, Thomas Fang Zheng, "DNN-based Discriminative Scoring for Speaker Recognition Based on i-vector", submitted to EURASIP ASM
2. Dong Wang, Askar Humdulla, Rayilam Parhat, Javier Tejedor, "Highly Restricted Keyword Selection Based on Sparse Analysis for Uyghur Text Categorization", submitted to the Expert system
3. Shi Yin, Zhiyong Zhang, Dong Wang, Fang Zheng, Yiguo Li, "Deep Neural Network based Voice Activity Detection", Submitted to Tsinghua Xuebao (in Chinese)
4. Chao Xing, Yiye Lin, Dong Wang, "something related to word embedding", submitted to NAACL 2015

# Research achievement

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- **Papers almost ready for submission: 2 SCI**

1. Fanhu Bie, Dong Wang, Thomas Fang Zheng, "Detection and Reconstruction of Clipped Speech in Speaker Recognition", target to Speech Communication
2. Bin Yuan, Xiaoxi Wang, Dong Wang, Semi-Dynamic Graph Embedding for Large Scale Language Model Adaptation, target to MTAP

- **Papers on preparation: 1 EI paper**

1. Rouzi Asrkar, Fanhu Bie, Jun Wang, Dong Wang, Thomas Fang Zheng, CROSS-LINGUAL SPEAKER VERIFICATION BASED ON LINEAR TRANSFORM, target to ChinaSIP 2015.

# Research achievement



## Patent: submitted (6)

刘荣,王东,郑方, "基于分布式神经网络的语言模型训练方法及其系统", 专利申请号: 2014100679169, 公布日期: 2014.05.21

王东, 王晓曦, 赵芳, 刘荣, 游世学, 一种信息查询方法和系统, 专利申请号: 2014103528476, 公布日期: 2014.12.10

王东, 刘荣, 游世学, 杜新凯, 基于问答系统的信息匹配的方法和装置, 提交

王东, 殷实, 张之勇, 郑方, 基于汉语声学模型的维语语音识别系统, 提交

王东, 刘超, 刘荣, 郑方, 一种基于稀疏矩阵的快速语音识别方法, 提交

王东, 游世学, 刘荣, 基于字的神经网络语言模型训练方法及其系统, 提交

## Patent: submitted by partners (2)

王东, 李权忠, 胡博: 通用英语口语打分系统

王东, 李权忠, 胡博: 相对英语口语打分系统

# Research achievement

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- **Technical report (3)**

[TRP-20140001: Automatic Scoring for English Utterances](#)

[TRP-20150001: Noisy Training for Deep Neural Networks in Speech Recognition](#)

[TRP-20150002: DNN-based Discriminative Scoring for Speaker Recognition Based on i-vector](#)



# Project and finance



- **7 projects, including the NFSC and collaborations from enterprise**
- **1194 k funding**
- **300k extra support**

# Plans for 2015



- **Team building**

- **Establish stable core team**
- **Welcome more students, particularly long-term students.**
- **Democracy**
- **Regularization that promote personal interests**

# Plan for 2015



- **Research focus**

- **Sparse deep learning**
  - **Multi-microphone cancellation**
  - **Multi-lingual ASR**
  - **Text and Knowledge embedding**
  - **QA**
- noise**

# Plans for 2015



- **Research goal**

- **20 papers, including 5 SCI journal**
- **One at least for one**
- **5 patens**

# Plan for 2015



- **Prepare for 1 offspring**
- **Children spoken QA**

- **Offspring**



我们的战略？



战略就是我们要做什么，并到哪里去！



## 团队战略

- 以培养人为宗旨
- 以国际一流实验室为目标
- 为实现每个人的理想提供机会





## 研究战略

- 由接轨到领先，国际一流
- 全面与重点并重，创造特色
- 极致，而非满意



我们的文化？



真正的文化是通过什么被弘扬、被奖励、被惩罚和  
被开除来深入人心



# 公平

- 我们具有共同的利益和价值观
- 公平比太阳的光辉还要重要
- 无欲则刚
- 公正、开放、透明、民主



## 工作

- 我们不要以他有多少时间呆在实验室来衡量他的努力
- 我们在乎的是，能否输出伟大的工作成就
- 自由，但不能松散
- 不是为了金钱，而是为了我们的理想而工作
- 优秀的人，金钱是自然而来的



## 高绩效

- 当你在享受安逸的时候，有无数比你聪明的人在努力工作
- 对“称职”，说**NO**
- 判断一个人价值的方法是：如果你要离开，我们会竭力挽留吗？
- 高绩效是从优秀到卓越
- 高绩效是你身边拥有一群超级棒的同事



## 快乐

- 是“快”+“乐”，短暂的，是心理的一种愉悦感受
- 追求“1”分钟的愉悦，我们需要付出“1万”分钟的努力
- 当你在得到优秀成果时，请给合作者竖大拇指，你在输出快乐。
- 快乐就是发现别人没有发现的东西，做先行者，探路人
- 尽量多的制造“快乐”，这是我们的责任



## 压力

- 压力是一块界碑，一边是退缩者，一边是提升者。
- 一块磨刀石，没有压力，智慧之光不会迸发
- 在逆境中，心要宁静，不要被杂念所侵蚀，执着向前。





- 你是否捡起办公室地上的垃圾
- 你是否随手关上，你桌上的电源
- 你愿意主动分享你的苹果

○ 热爱



- 你对未知事物是欣悦还是恐惧？
- 你始终都在用惯常的方法工作忙吗？
- 你自己改进了什么，你帮助别人提高了什么？

○ 创新



- 知识工作者都是管理者
- 你连自己都没有管理好，不要奢谈职业规划
- 认清自我、管理自我、识别他人的情绪、自我激励、管理好人际关系
- 你总是先让自己达到，然后再要求别人
- 如果你命令他造一艘船，请培养他对大海的渴望

○ 管理



- 当你的组员犯了错，你首先要做的不是骂他们，而是先自我反省
- 对于目标，你是否传递的足够清晰，对于热情，你是否培养了足够的兴趣
- 我们是否足够透明、足够开诚布公

○ 管理



- 智、信、仁、勇、严
- 一个器皿，美轮美奂
- 被尊重，是一种享受

○ 人才



- 催生进步的原动力
- 不贰过
- 大自然优胜劣汰的法则
- 有人是主力，收获荣誉和金钱，有人是替补，品尝苦涩和泪水
- 我们要成为第一，就需要不断的自我否定

○ 竞争



- 规则是为了防止混乱
- 规则和流程也在某种程度上，扼杀了创新和自由
- 规则也是官僚化的温床
- 因为人才的密度和高绩效文化还没有形成，所以我们需要规则，以防止混乱
- 其实，我们需要的是自律、思考、创新、冒险以及高绩效，而非带着脚链跳舞

## ○ 规则



- 知识工作者的价值是通过别人来体现的
- 你要输出A级成果，让合作者乐于使用，而不是成为瑕疵品的根源
- 你要知道你在做什么，你要确认，你输出的成果，一定是合作者期望的吗？
- 如果做的好，请给你的合作者竖一个大拇指
- 如果你得不到合作者的赞许，请离开你的岗位

○ 合作





## 挑战

- 我们在从事一项伟大的事业，同时极为艰难
- 我们需要一批志同道合者一起共担风雨，共享光荣
- 我们有机会成功，但必须付出别人百倍的努力
- 辛勤得来的桂冠，是对我们人生的最高奖赏



高山仰止、景行行止！