第一届山东省人工智能大会

（The First Shandong Conference on Artificial Intelligence，SDAI 2018）

程序册

主　　办：山东省人工智能学会

承　　办：山东大学　　山东财经大学

协助承办：山东电子商会

赞　　助：海康威视　　山东联科云计算股份有限公司

2018 年 12 月

中国　济南

前 言

山东省人工智能大会（Shandong Conference on Artificial Intelligence，SDAI）是由山东省人工智能学会主办的人工智能领域会议。会议旨在为山东人工智能从业者提供一个互动交流平台，使参会者了解最前沿的学术和产业应用动态，分享人工智能领域特别是山东省人工智能领域的最新科研和技术成果、创新思想和科学方法，提高山东省人工智能领域的学术研究和产业应用水平，服务山东省新旧动能转换战略部署，促进山东省人工智能的研究、开发、应用及其与国内外同行的交流合作。

第一届山东省人工智能大会（SDAI 2018）将于 2018 年 12 月 14-16 日在山东省济南市南郊宾馆举行，由山东大学、山东财经大学共同承办，山东电子商会协助承办。本次会议将邀请省内外人工智能领域学术界和产业界的专家学者就人工智能各领域的热点问题进行近十场主题报告。

本次会议还组织了顶级论文“Spotlight ” 环节，征集了近两年省内高校、科研院所在人工智能相关领域顶级会议和期刊发表的论文（限定为 CCF A 类会议长文或 CCF B 类及以上期刊论文或交叉学科领域顶级期刊论文），并邀请专家评审，共有 25 篇论文通过评审，通过评审的论文作者现场口头报告分享研究成果。

本届山东省人工智能大会为与会者提供了一场精彩的学术盛宴和一个广阔的学术交流平台，感谢大会报告专家、参会者对本次会议的支持和参与，感谢大会承办单位、协办单位、赞助单位以及会议组织机构成员的辛勤付出。

SDAI 2018 程序委员会、组织委员会

2018 年 12 月

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第一届山东省人工智能大会组织机构

大会主席

陈月辉（济南大学）　　尹义龙（山东大学）

程序委员会主席

董祥军（齐鲁工业大学（山东省科学院））

杨公平（山东大学）　　聂秀山（山东财经大学）

组织委员会主席

周元峰（山东大学）　　崔超然（山东财经大学）

林培光（山东财经大学）

宣传主席

吕雪岭（山东联科云计算股份有限公司）

李　强（山东电子商会）

Spotlight 主席

马宏伟（山东建筑大学）

裘肖明（山东财经大学）

组织委员会委员

蒋志方（山东大学）　　连　莉（山东大学）

孟宪静（山东财经大学）　　耿蕾蕾（山东财经大学）

杨　璐（山东财经大学）　　邹立达（山东财经大学）

冉令强（山东财经大学）　　杨　帆（山东财经大学）

吕　鹏（山东财经大学）

一、SDAI 2018 会议总体日程安排

序号	时间	项目	地点
1	12 月 14 日 14:00-20:00 12 月 15 日全天	报到、现场注册	主楼大厅
2	12 月 14 日晚 20:30-22:00	山东省人工智能学会理事会工作会议	俱乐部四楼小礼堂
3	12 月 15 日上午	SDAI 2018 大会开幕式、特邀报告	俱乐部一楼礼堂
4	12 月 15 日下午	SDAI 2018 大会特邀报告、Spotlight 论文报告	俱乐部一楼礼堂
5	12 月 15 日晚 18:00-20:00	晚宴	俱乐部一楼餐厅
6	12 月 16 日上午	SDAI 2018 大会特邀报告、闭幕式	俱乐部一楼大礼堂

二、SDAI 2018 大会具体日程安排

12 月 15 日上午			
时间	活动	地点	主持人
08: 30—09: 00	开幕式: 1. 山东省科协领导致辞 2. 承办单位领导致辞 3. 学会领导致辞 4. 会议筹备工作报告	俱乐部一楼礼堂	董祥军 教授 齐鲁工业大学（山东省科学院）
09: 00—09: 15	参会代表合影	俱乐部会议厅门口	
大会特邀报告（地点：俱乐部一楼礼堂）			
时间	报告人	报告题目	主持人
09: 15 — 10: 05	刘青山 教授 南京信息工程大学	图像特征学习	张化祥 教授 山东师范大学
10: 05 — 10: 25	茶 歇		
10: 25 — 11: 15	高新波 教授 西安电子科技大学	混合增强智能中的大数据与小数据	梁永全 教授 山东科技大学
11: 15 — 12: 05	陈恩红 教授 中国科学技术大学	大数据驱动的智慧教育	董军宇 教授 中国海洋大学
12: 10 — 13: 25	午 餐（地点：主楼一楼餐厅 ）		
12 月 15 日下午			
时间	报告人	报告题目	主持人
14:00 —14:50	梁永全 教授 山东科技大学	人工智能“十五年周期定律”与思考	林培光 教授 山东财经大学
14:50 — 15:40	李明天 高级工程师 海康威视研究院	AI 技术助力产业升级	吕雪岭 董事长 山东联科云计算股份有限公司
15:40— 16:00	茶歇		
16:00 — 17:00	Spotlight 论文报告		马宏伟 教授 山东建筑大学
18:00 — 20:00	晚 宴（主楼一楼餐厅 ）		

12 月 16 日上午			
大会特邀报告（地点：俱乐部一楼礼堂）			
时间	报告者	报告题目	主持人
08:30 — 09:05	郑方 教授 清华大学	声纹识别研究与应用	杨公平 教授 山东大学
09:05 — 09:40	聂礼强 教授 山东大学	智能媒体计算“一瞥”	宫法明 教授 中国石油大学（华东）
09:40 — 10:15	李鹏 董事长 山东领信信息科技股份有限公司	智能机器人---历史、现状与应用展望	董祥军 教授 齐鲁工业大学（山东省科学院）
10:15 — 10:35	茶　歇		
10:35 — 11:10	孙华晨 总工程师 山东精诚电子科技有限公司	智慧矿山关键技术及应用	聂秀山 教授 山东财经大学
闭幕式			
时间	活动	地点	主持人
11: 10—11: 50	1. 赞助单位宣讲、授牌仪式 2. 报告学会会员发展情况 3. 单位会员授牌仪式 4. 学会领导闭幕致辞	俱乐部一楼礼堂	魏本征 教授 山东中医药大学
12: 00—13: 10	午餐	主楼一楼餐厅	

三、大会特邀报告

大会特邀报告（一）

报 告 人：刘青山 教授（南京信息工程大学）

报告题目：图像特征学习

报告摘要：机器视觉的目标就是让机器能像人一样自动“看懂”外部环境，因此是人工智能领域的一个重要研究方向。图像特征学习是机器视觉研究的核心问题，其目的是视觉信息进行加工分析，以便于进一步实现视觉理解。在汇报中，我将重点从高维视觉特征表达和深度视觉特征学习两个方面，介绍我们团队近年来及在人脸图像配准、目标检测和遥感图像分析上的一些应用研究。

专家简介：刘青山博士现任南京信息工程大学教授、博导、江苏省大数据分析技术重点实验室主任。2000 年 4 月毕业于中科院自动化所模式识别国家重点实验室获博士学位，随后留实验室工作，2006 年 4 月赴美国 Rutger 大学访问、工作。2011 年 9 月加盟南京信息工程大学。先后入选江苏省特聘教授、江苏省双创团队领军人才、全国高校黄大年式教师团队、科技部中青年创新领军人才等。是江苏省人工智能学会副理事长、中国自动化学会模式识别与机器智能专委会副主任、中国计算机学会多媒体专委会和计算机视觉专委会常务委员等。受邀担任国际杂志《NeuroComputing》、《Signal Processing》和国内杂志《自动化学报》编委。主要研究方向为图像与视频分析、计算机视觉、和机器学习。先后主持承担国家杰出青年基金项目、国家自然基金重点项目、面上项目、江苏省杰出青年基金等。以第一完成人获 2016 年度教育部自然科学二等奖和 2017 年江苏省教学成果二等奖，以及获 2016 年江苏省优秀教育工作者称号。

大会特邀报告（二）

报 告 人：高新波 教授（西安电子科技大学）

报告题目：混合增强智能中的大数据与小数据

报告摘要：随着深度学习研究的不断深入，人工智能技术得以迅猛发展。大数据、高性能计算和学习算法成为人工智能的三大基石。新的深度神经网络结构不断涌现，对训练大数据的需求也不断提升，因此媒体上产生了“第一批被人工智能累死的人”的相关报道。目前，机器智能需要大数据和人类智慧需要小数据之间形成了鲜明的对比。本报告将从大小数据的优缺点以及人类智慧与机器智能的区别出发，以新一代人工智能发展规划部署的五大方向之一——混合增强智能为例，尝试解决人机交互中的大数据向小数据的转化问题，从而思考在人工智能系统的设计中大数据与小数据的辩证关系。

专家简介：高新波，博士，国家万人计划科技创新领军人才，新世纪百千万人才工程国家级人选，国家杰出青年科学基金获得者，科技部重点领域创新团队负责人、教育部创新团队负责人。IET Fellow、CIE Fellow、IEEE 高级会员、中国图象图形学学会常务理事、中国计算机学会理事。主要从事计算机视觉机器学习等领域的研究和教学工作，获国家自然科学二等奖 1 项、省部级科学技术一等奖 3 项。

大会特邀报告（三）

报 告 人：陈恩红 教授（中国科学技术大学）

报告题目：大数据驱动的智慧教育

报告摘要：智慧教育是现代教育发展的一个重要方向。过去受教育资源、分析技术等的限制，智慧教育发展一直较为迟缓。随着教育信息化进程的不断深入，越来越多的教育数据（如学生答题数据）以伴随式的方式被收集起来，为数据驱动的智慧教育发展提供了良机，在“教、学、考、评、管”等各教育环节上，学术与业界都取得了显著进展。本报告将简要介绍大数据分析在驱动智慧教育方面的一些重要研究成果，尤其是如何利用数据挖掘技术和教育领域知识应对教育数据的稀疏异构性、学生学习过程的复杂性与个性化需求的多样性等带来的挑战。

专家简介：陈恩红，中国科学技术大学大数据学院常务副院长，计算机科学与技术学院副院长，大数据分析及应用安徽省重点实验室主任。CCF 会士，国家杰出青年基金获得者，科技部重点领域创新团队负责人，中组部“万人计划”科技创新领军人才。IEEE Transactions on System Man and Cybernetics: System 、 ACM Transactions on Intelligent System 、 Knowledge and Information System 等期刊编委。曾获 KDD 2008 最佳应用论文奖、KDD 2018 最佳学生论文奖、ICDM 2012 最佳研究论文奖等。

大会特邀报告（四）

报 告 人： 梁永全 教授（山东科技大学）

报告题目：人工智能“十五年周期定律”与思考

报告摘要：人工智能是近几年各行各业关注的热点领域。本报告将首先回顾螺旋上升的60年人工智能发展史，介绍主要的研究领域及标志性成果，然后总结归纳出人工智能的“十五年周期定律”，并从国际、国家、产业、山东省、高校等五个方面浅析人工智能的发展趋势，最后对人工智能所处的位置、将来的发展方向、山东省人工智能的生态及事业发展等方面给出一些思考。

专家简介：梁永全，博士，教授，博士生导师，山东科技大学计算机科学与工程学院/人工智能学院院长。学术兼职包括中国计算机学会高级会员、中国人工智能学会理事、山东省人工智能学会副理事长、青岛市计算机学会副理事长、山东计算机学会智能科学与技术专委会主任等。1989 年毕业于本校应用数学专业，1992 年和 1999 年分别从北航和中科院计算研究所取得硕士和博士学位。现为青岛市物联网与软件技术重点实验室主任、山东省名校工程重点建设专业负责人，获得省级教学成果 5 项。现主持国家重点研发项目课题和国家自然科学基金项目各 1 项，完成省部级以上项目 10 余项，获得省部级科研奖励 2 项，发表论文 80 余篇。曾获山东省中青年学术骨干、优秀研究生指导教师、千名知名技术专家等荣誉称号。

大会特邀报告（五）

报 告 人： 李明天 高级工程师（海康威视研究院）

报告题目：AI 技术助力产业升级

报告摘要：本次报告主要介绍 AI 技术的研究方向，从算法研究、基础研究及应用研究等几个方面进行展开介绍。另外，本次报告还会分享 AI 技术在行业中的落地相关情况，主要从案例的角度介绍 AI 技术如何引领产业走向可视化、智能化等。

专家简介：李明天，现任职于海康威视研究院智能算法部，高级解决方案工程师。李明天参与的项目包括基于深度学习的安全帽智能检测、AI 智慧课堂行为分析及其他特定场景（如海关、监所等）目标检测及行为分析等，目前主要负责海康威视研究院智能算法推广及解决方案相关工作等。

大会特邀报告（六）

报 告 人： 郑方 教授（清华大学）

报告题目：声纹识别研究与应用

报告摘要：本报告详细介绍了声纹识别的概念、分类、原理、主流特征提取及模式划分方法，说明了声纹识别可能的应用场景，从应用角度出发分析了所面临的、亟待解决的关键技术问题，并给出了解决方案。本报告还专门就基于声纹确认技术的无监督身份认证的技术要求进行了讨论，对语音信号的特点进行了理论分析，给出给予语音处理技术的低成本、高安全和弱隐私的声纹身份认证解决方案，并介绍了其应用和标准化进展，尤其是在移动金融领域的标准化工作。

专家简介：郑方，博士、教授、博士生导师，清华大学语音和语言技术中心主任，北京得意音通技术有限责任公司董事长、得意音通信息技术研究院院长；IEEE 高级会员、APSIPA（亚太区信号与信息处理联合会）副主席、中国声学学会理事、中国中文信息学会理事、中国中文信息学会语音专委会主任、中国计算机学会语音对话与听觉专业组副主任等。郑方博士从事语音语言处理和生物特征识别的研发近 30 年，是全国安防标委会人体生物特征识别应用分委会副主任委员、中文语音交互技术标准工作组声纹识别专题组组长、全国信标委生物特征识别分委会委员等，是声纹相关所有的国家和行业标准的主要起草者。

大会特邀报告（七）

报 告 人：聂礼强 教授（山东大学）

报告题目： 智能媒体计算“一瞥”

报告摘要：山东大学智能媒体研究中心主要研究信息检索、多媒体计算、及其在现实生活中的应用。其中信息检索方向包含问答系统、健康检索、隐私保护以及跨社交媒体学习等；多媒体计算方向包含音频、图像、视频的分析与理解，目标个体行为分析、服装搭配等；研究主要应用在电力运营智能监控、金融反欺诈、短视频分析等领域。讲者将主要和大家一起分享山东大学智能媒体研究中心的科研情况，演示一些原型系统。

专家简介：聂礼强博士现任山东大学计算机科学与技术学院教授、博士生导师、山东大学泰山学堂/精英班教授小组组长、山东省人工智能研究院院长。其于 2009 年和 2013 年分别从西安交通大学和新加坡国立大学获得学士和博士学位。博士毕业后，在新加坡国立大学计算机学院以研究员身份从事科研工作三年半。主要研究兴趣为多媒体检索。近五年在国际重要学术期刊和会议发表论文百余篇，如 SIGIR、TOIS、ACM MM、TMM 等，专著一部；截止 2018 年 10 月，Google Scholar 引用 3000 余次。主持多项横纵向基金。聂礼强博士曾担任多个国际著名期刊的客座编委，如 IEEE Trans. On Big Data, ACM Tans. on MM (ToMM)等；担任国际会议 ICIMCS 2017 程序委员会主席和 Information Science 编委；担任 CCF A 类会议 ACM MM 2018 领域主席；担任 PCM 2018 special session 主席。

大会特邀报告（八）

报 告 人： 李鹏 董事长（山东领信信息科技股份有限公司）

报告题目： 智能机器人---历史、现状与应用展望

报告摘要：智能机器人是一个多学科交叉的新兴学科领域，涉及机械工程、控制系统、信号处理、人工智能、概率统计等相关学科的知识。本报告主要从智能机器人必须具备的感觉、运动、思维等三个主要要素出发，重点介绍智能机器人传感系统、运动控制系统、智能交互系统等主要系统的研究历史、现状与应用展望。

专家简介：李鹏，男，汉族，1982 年 2 月出生，领信股份创始人，研究生学历、博士学位。现任领信股份董事长，山东大学特聘创业导师。2010 年创立领信股份。2014 年公司在新三板挂牌上市，股票简称：领信股份，股票代码：831129，是山东省第一家做市交易的互联网软件企业。曾获省政府“首届十大创业之星”、工信部教育部“全国示范性软件学院建院十周年 2001-2011 全国十佳本科毕业生”、省经信委“山东省优秀软件企业家”、“2011 创业中国年度十大行业典型人物”、省发改委“山东省服务业创新团队”带头人、国家发改委“2015 年度改革十大最具影响力人物”、2016 金典奖“中国软件与信息服务业十大创新人物”、“2016 年中国诚信企业家”、“2017 年山东省诚信建设示范企业领军人物”等荣誉称号。

大会特邀报告（九）

报 告 人： 孙华晨 高级工程师（山东精诚电子科技有限公司）

报告题目： 智慧矿山关键技术及应用

报告摘要：建设智慧矿山是煤矿安全、高效、绿色发展的必由之路。通过分析煤矿人工智能技术应用现状，结合煤矿生产现场实际和智慧矿山标准要求，提出了 CPaaS 平台的智能化建设内容及人工智能技术实现思路，以及煤矿特殊环境下边缘设备人工智能实现的方式方法。介绍了 CPaaS 平台对智慧矿山信息化建设的重要性。

专家简介：孙华晨，男，46 岁，近二十年煤炭行业软件开发和信息化服务经验，现任山东精诚电子科技有限公司总工程师。

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论文摘要

（1）Spine-GAN: Semantic segmentation of multiple spinal structures

Abstract： Spinal clinicians still rely on laborious workloads to conduct comprehensive assessments of multiple spinal structures in MRIs, in order to detect abnormalities and discover possible pathological factors. The objective of this work is to perform automated segmentation and classification (i.e., normal and abnormal) of intervertebral discs, vertebrae, and neural foramen in MRIs in one shot, which is called semantic segmentation that is extremely urgent to assist spinal clinicians in diagnosing neural foraminal stenosis, disc degeneration, and vertebral deformity as well as discovering possible pathological factors. However, no work has simultaneously achieved the semantic segmentation of intervertebral discs, vertebrae, and neural foramen due to three-fold unusual challenges: 1) Multiple tasks, i.e., simultaneous semantic segmentation of multiple spinal structures, are more difficult than individual tasks; 2) Multiple targets:average 21 spinal structures per MRI require automated analysis yet have high variety and variability;3) Weak spatial correlations and subtle differences between normal and abnormal structures generate dynamic complexity and indeterminacy. In this paper, we propose a Recurrent Generative Adversarial Network called Spine-GAN for resolving above-aforementioned challenges. Firstly, Spine-GAN explicitly solves the high variety and variability of complex spinal structures through an atrous convolution (i.e.,convolution with holes) autoencoder module that is capable of obtaining semantic task-aware representation and preserving fine-grained structural information. Secondly, Spine-GAN dynamically models the spatial pathological correlations between both normal and abnormal structures thanks to a specially designed long short-term memory module. Thirdly, Spine-GAN obtains reliable performance and efficient-generalization by leveraging a discriminative network that is capable of correcting predicted errors and global-level contiguity. Extensive experiments on MRIs of 253 patients have demonstrated that Spine-GAN achieves high pixel accuracy of 96.2%, Dice coefficient of 87.1%, Sensitivity of 89.1% and Specificity of 86.0%, which reveals its effectiveness and potential as a clinical tool.

（2）Finger Vein Recognition with Anatomy Structure Analysis

Abstract： Finger vein recognition has received a lot of attention recently and is viewed as a promising biometric trait. In related methods, vein pattern-based methods explore intrinsic finger vein recognition, but their performance remains unsatisfactory owing to defective vein networks and weak matching. One important reason may be the neglect of deep analysis of the vein anatomy structure. By comprehensively exploring the anatomy structure and imaging characteristic of vein patterns, this paper proposes a novel finger vein recognition framework, including an anatomy structure analysis-based vein extraction algorithm and an integration matching strategy. Specifically, the vein pattern is extracted from the orientation map-guided curvature based on the valley- or half valley-shaped cross-sectional profile. In addition, the extracted vein pattern is further thinned and refined to obtain a reliable vein network. In addition to the vein network, the relatively clear vein branches in the image are mined from the vein pattern, referred to as the vein backbone. In matching, the vein backbone is used in vein network calibration to overcome finger displacements. The similarity of two calibrated vein networks is measured by the proposed elastic matching and further recomputed by integrating the overlap degree of corresponding vein backbones. Extensive experiments on two public finger vein databases verify the effectiveness of the proposed framework.

（3）Finger Vein Code: From Indexing to Matching

Abstract： Vein pattern-based methods powerfully boost the recognition accuracy of finger veins, but real-time recognition cannot be guaranteed, especially in large-scale applications. Moreover, previous studies focused on either the matching task to enhance the accuracy or the indexing task to improve the efficiency. This paper proposes a finger vein code indexing method and combines it with a finger vein pattern matching method into an integration framework for improving both accuracy and efficiency. With the extracted vein patterns, the direction of each vein segment is detected and represented by the elliptical direction map as a feature for indexing, which will be encoded into a binary code by the angle K-means. The similarity between vein direction codes is measured by the grouped hamming distance in indexing, and further weighted by the overlap degree of the corresponding vein patterns to return the candidates for the probe. In addition, based on the above distance measurement, only vein segments with the same direction code are considered in following probe-to-candidate matching. Experimental results indicate that our indexing method outperforms the state-of-the-art methods and has competitive potential in performing the matching task. The results also indicate that the integration framework highly improves the identification efficiency with a slight improvement on the accuracy

（4）PCNN: Deep Convolutional Networks for Short-Term Traffic Congestion Prediction

Abstract： Traffic problems have seriously affected people's life quality and urban development, and forecasting short-term traffic congestion is of great importance to both individuals and governments. However, understanding and modeling the traffic conditions can be extremely difficult, and our observations from real traffic data reveal that: 1) similar traffic congestion patterns exist in the neighboring time slots and on consecutive workdays and 2) the levels of traffic congestion have clear multiscale properties. To capture these characteristics, we propose a novel method named PCNN, which is based on a deep convolutional neural network, modeling periodic traffic data for short-term traffic congestion prediction. PCNN has two pivotal procedures: time series folding and multi-grained learning. It first temporally folds the time series and constructs a 2-D matrix as the network input, such that both the real-time traffic conditions and past traffic patterns are well considered; then, with a series of convolutions over the input matrix, it is able to model the local temporal dependency and multiscale traffic patterns. In particular, the global trend of congestion can be addressed at the macroscale, whereas more details and variations of the congestion can be captured at the microscale. Experimental results on a real-world urban traffic data set confirm that folding time series data into a 2-D matrix is effective and PCNN outperforms the baselines significantly for the task of short-term congestion prediction.

（5）MPE: a mobility pattern embedding model for predicting next locations

Abstract： The wide spread use of positioning and photographing devices gives rise to a deluge of traffic trajectory data (e.g., vehicle passage records and taxi trajectory data), with each record having at least three attributes: object ID, location ID, and time-stamp. In this paper, we propose a novel mobility pattern embedding model called MPE to shed the light on people's mobility patterns in traffic trajectory data from multiple aspects, including sequential, personal, and temporal factors. MPE has two salient features: (1) it is capable of casting various types of information (object, location and time) to an integrated low-dimensional latent space; (2) it considers the effect of "phantom transitions" arising from road networks in traffic trajectory data. This embedding model opens the door to a wide range of applications such as next location prediction and visualization. Experimental results on two real-world datasets show that MPE is effective and outperforms the state-of-the-art methods significantly in a variety of tasks.

（6）p-Laplacian Regularization for Scene Recognition

Abstract： The explosive growth of multimedia data on the Internet makes it essential to develop innovative machine learning algorithms for practical applications especially where only a small number of labeled samples are available. Manifold regularized semi-supervised learning (MRSSL) thus received intensive attention recently because it successfully exploits the local structure of data distribution including both labeled and unlabeled samples to leverage the generalization ability of a learning model. Although there are many representative works in MRSSL, including Laplacian regularization (LapR) and Hessian regularization, how to explore and exploit the local geometry of data manifold is still a challenging problem. In this paper, we introduce a fully efficient approximation algorithm of graph p-Laplacian, which significantly saving the computing cost. And then we propose p-LapR (pLapR) to preserve the local geometry. Specifically, p-Laplacian is a natural generalization of the standard graph Laplacian and provides convincing theoretical evidence to better preserve the local structure. We apply pLapR to support vector machines and kernel least squares and conduct the implementations for scene recognition. Extensive experiments on the Scene 67 dataset, Scene 15 dataset, and UC-Merced dataset validate the effectiveness of pLapR in comparison to the conventional manifold regularization methods.

（7）Hypergraph p-Laplacian Regularization for Remotely Sensed Image Recognition

Abstract： Graph-based and manifold-regularization (MR)- based semi-supervised learning, including Laplacian regularization (LapR) and hypergraph LapR (HLapR), have achieved prominent performance in preserving locality and similarity information. However, it is still a great challenge to exactly explore and exploit the local structure of the data distribution. In this paper, we present an efficient and effective approximation algorithm of hypergraph p-Laplacian and then propose hypergraph p-LapR (HpLapR) to preserve the geometry of the probability distribution. In particular, hypergraph is a generalization of a standard graph while hypergraph p-Laplacian is a nonlinear generalization of the standard graph Laplacian. The proposed HpLapR shows great potential to exploit the local structures. We integrate HpLapR with logistic regression for remote sensing image recognition. Experiments on UC-Merced data set demonstrate that the proposed HpLapR has superior performance compared with several popular MR methods including LapR and HLapR.

（8）Feature Selection Based Transfer Subspace Learning for Speech Emotion Recognition

Abstract： Cross-corpus speech emotion recognition has recently received considerable attention due to the widespread existence of various emotional speech. It takes one corpus as the training data aiming to recognize emotions of another corpus, and generally involves two basic problems, i.e., feature matching and feature selection. Many previous works study these two problems independently, or just focus on solving the first problem. In this paper, we propose a novel algorithm, called feature selection based transfer subspace learning (FSTSL), to address these two problems. To deal with the first problem, a latent common subspace is learnt by reducing the difference of different corpora and preserving the important properties. Meanwhile, we adopt the l2;1-norm on the projection matrix to deal with the second problem. Besides, to guarantee the subspace to be robust and discriminative, the geometric information of data is exploited simultaneously in the proposed FSTSL framework. Empirical experiments on cross-corpus speech emotion recognition tasks demonstrate that our proposed method can achieve encouraging results in comparison with state-of-the-art algorithms.

（9）Inferring Mobility Relationship via Graph embedding

Abstract： Inferring social relationships from user location data has become increasingly important for real-world applications, such as recommendation, advertisement targeting, and transportation scheduling. Most existing mobility relationship measures are based on pairwise meeting frequency, that it, the more frequently two users meet (i.e., co-locate at the same time), the more likely that they are friends. However, such frequency-based methods suffer greatly from data sparsity challenge. Due to data collection limitation and bias in the real world (e.g., check-in data), the observed meeting events between two users might be very few. On the other hand, existing methods focus too much on the interactions between two users, but fail to incorporate the whole social network structure. For example, the relationship propagation is not well utilized in existing methods. In this paper, we propose to construct a user graph based on their spatial-temporal interactions and employ graph embedding technique to learn user representations from such a graph. The similarity measure of such representations can well describe mobility relationship and it is particularly useful to describe the similarity for user pairs with low or even zero meeting frequency. Furthermore, we introduce semantic information on meeting events by using point-of-interest (POI) categorical information. Additionally, when part of the social graph is available as friendship ground truth, we can easily encode such online social network information through a joint graph embedding. Experiments on two real-world datasets demonstrate the eectiveness of our proposed method.

（10）Outlier Detection over Massive-Scale Trajectory Streams

Abstract： The detection of abnormal moving objects over high-volume trajectory streams is critical for real-time applications ranging from military surveillance to transportation management. Yet this outlier detection problem, especially along both the spatial and temporal dimensions, remains largely unexplored. In this work, we propose a rich taxonomy of novel classes of neighbor-based trajectory outlier definitions that model the anomalous behavior of moving objects for a large range of real-time applications. Our theoretical analysis and empirical study on two real-world datasets—the Beijing Taxi trajectory data and the Ground Moving Target Indicator data stream—and one generated Moving Objects dataset demonstrate the effectiveness of our taxonomy in effectively capturing different types of abnormal moving objects. Furthermore, we propose a general strategy for efficiently detecting these new outlier classes called the minimal examination (MEX) framework. The MEX framework features three core optimization principles, which leverage spatiotemporal as well as the predictability properties of the neighbor evidence to minimize the detection costs. Based on this foundation, we design algorithms that detect the outliers based on these classes of new outlier semantics that successfully leverage our optimization principles. Our comprehensive experimental study demonstrates that our proposed MEX strategy drives the detection costs 100-fold down into the practical realm for applications that analyze high-volume trajectory streams in near real time.

（11）Truthful incentive mechanism with location privacy-preserving for mobile crowdsourcing systems

Abstract： With the rapid development of mobile devices, mobile crowdsourcing has become an important research focus. In order to improve the efficiency and truthfulness of mobile crowdsourcing systems, this paper proposes a truthful incentive mechanism with location privacy-preserving for mobile crowdsourcing systems. The improved two-stage auction algorithm based on trust degree and privacy sensibility (TATP) is proposed. In addition, the k - ε-differential privacy-preserving is proposed to prevent users' location information from being leaked. Through comparison experiments, the effectiveness of the proposed incentive mechanism is verified. The proposed incentive mechanism with location privacy-preserving can inspire users to participate sensing tasks, and protect users' location privacy effectively.

（12）DifNet: Semantic Segmentation by Diffusion Networks

Abstract： Deep Neural Networks (DNNs) have recently shown state of the art performance on semantic segmentation tasks, however, they still suffer from problems of poor boundary localization and spatial fragmented predictions. The difficulties lie in the requirement of making dense predictions from a long path model all at once, since details are hard to keep when data goes through deeper layers. Instead, in this work, we decompose this difficult task into two relative simple sub-tasks: seed detection which is required to predict initial predictions without the need of wholeness and preciseness, and similarity estimation which measures the possibility of any two nodes belong to the same class without the need of knowing which class they are. We use one branch network for one sub-task each, and apply a cascade of random walks base on hierarchical semantics to approximate a complex diffusion process which propagates seed information to the whole image according to the estimated similarities. The proposed DifNet consistently produces improvements over the baseline models with the same depth and with the equivalent number of parameters, and also achieves promising performance on Pascal VOC and Pascal Context dataset. Our DifNet is trained end-to-end without complex loss functions.

（13）Adaptive Semi-supervised Feature Selection for Cross-modal Retrieval

Abstract： In order to exploit the abundant potential information of the unlabeled data and contribute to analyze the correlation among heterogeneous data, we propose the semi-supervised model named Adaptive Semi-supervised Feature Selection (ASFS) for cross-modal retrieval. Firstly, we utilize the semantic regression to strengthen the neighbor relationship between the data with the same semantic. And the correlation between heterogeneous data can be optimized via keeping the pairwise closeness when learning the common latent space. Secondly, we adopt the graph-based constraint to predict accurate labels for unlabeled data, and it can also keep the geometric structure consistency between the label space and feature space of heterogeneous data in the common latent space. Finally, an efficient joint optimization algorithm is proposed to update the mapping matrices and label matrix for unlabeled data simultaneously and iteratively. It makes samples from different classes to be far apart while the samples from same class lie as close as possible. Meanwhile, the l2;1-norm constraint is used for feature selection and outliers reduction when the mapping matrices are learned. In addition, we propose learning different mapping matrices corresponding to different sub-tasks to emphasize the semantic and structural information of query data. Experiment results on three datasets demonstrate that our method performs better than the state-of-the-art methods.

（14）Public Interest Analysis Based on Implicit Feedback of IPTV Users

Abstract： Modern information systems make it increasingly easy to gain more insight into the public interest, which is becoming more and more important in diverse public and corporate activities and processes. The disadvantage of existing research that focuses on mining the information from social networks and online communities is that it does not uniformly represent all population groups and that the content can be subjected to self-censoring or curation. In this paper, we propose and describe a framework and a method for estimating public interest from the implicit negative feedback collected from the Internet protocol television (IPTV) audience. Our research focuses primarily on the channel change events and their match with the content information obtained from closed captions. The presented framework is based on concept modeling, viewership profiling, and combines the implicit viewer reactions (channel changes) into an interest score. The proposed framework addresses both above-mentioned disadvantages or concerns. It is able to cover a much broader population, and it can detect even minor variations in user behavior. We demonstrate our approach on a large pseudonymized real-world IPTV dataset provided by an ISP, and show how the results correlate with different trending topics and with parallel classical long-term population surveys.

（15）Queueing Algorithm for Effective Target Coverage in Mobile Crowd Sensing

Abstract： In recent years, various researches have been conducted in order to find ways to cover a target or groups of targets with priority-based target coverage and sensor deployment mechanisms taking the front seats. However, with these researches, effective target coverage has been a recurrent issue due to various factors like conflict between sensors and excessive waiting time for targets to be covered. In this paper, we proposed an algorithm based on queuing theory in tandem with mobile crowd sensing to tackle these issues. To do this, first, we develop some models which are based on the birth-and-death mechanism (one of the tools in queuing theory) to determine how long a target has to wait, the mean busy period of sensors and mean idle period of sensors. While developing these models, we consider cases where there exist a single sensor and n-sensors in the system. Based on these models, we develop the required algorithm. The simulation result shows that as the number of sensors increases relative to the number of targets, an average time before a target gets discovered is 0.2s and sensor utilization decreasing toward zero as the number of sensors increases.

（16）Improving Neural-Network Classifiers Using Nearest Neighbor Partitioning

Abstract： This paper presents a nearest neighbor partitioning method designed to improve the performance of a neural-network classifier. For neural-network classifiers, usually the number, positions, and labels of centroids are fixed in partition space before training. However, that approach limits the search for potential neural networks during optimization; the quality of a neural network classifier is based on how clear the decision boundaries are between classes. Although attempts have been made to generate floating centroids automatically, these methods still tend to generate sphere-like partitions and cannot produce flexible decision boundaries. We propose the use of nearest neighbor classification in conjunction with a neural-network classifier. Instead of being bound by sphere-like boundaries (such as the case with centroid-based methods), the flexibility of nearest neighbors increases the chance of finding potential neural networks that have arbitrarily shaped boundaries in partition space. Experimental results demonstrate that the proposed method exhibits superior performance on accuracy and average f-measure.

（17）Discrete Optimal Graph Clustering

Abstract： Graph based clustering is one of the major clustering methods. Most of it work in three separate steps: similarity graph construction, clustering label relaxing and label discretization with k-means. Such common practice has three disadvantages: 1) the predefined similarity graph is often fixed and may not be optimal for the subsequent clustering. 2) the relaxing process of cluster labels may cause significant information loss. 3) label discretization may deviate from the real clustering result since k-means is sensitive to the initialization of cluster centroids. To tackle these problems, in this paper, we propose an effective discrete optimal graph clustering (DOGC) framework. A structured similarity graph that is theoretically optimal for clustering performance is adaptively learned with a guidance of reasonable rank constraint. Besides, to avoid the information loss, we explicitly enforce a discrete transformation on the intermediate continuous label, which derives a tractable optimization problem with discrete solution. Further, to compensate the unreliability of the learned labels and enhance the clustering accuracy, we design an adaptive robust module that learns prediction function for the unseen data based on the learned discrete cluster labels. Finally, an iterative optimization strategy guaranteed with convergence is developed to directly solve the clustering results. Extensive experiments conducted on both real and synthetic datasets demonstrate the superiority of our proposed methods compared with several state-of-the-art clustering approaches.

（18）Simultaneous Estimation of Low-and High-order Functional Connectivity for Identifying Mild Cognitive Impairment.

Abstract： Functional connectivity (FC) network has been becoming an increasingly useful tool for understanding the cerebral working mechanism and mining sensitive biomarkers for neural/mental disease diagnosis. Currently, Pearson's Correlation (PC) is the simplest and most commonly used scheme in FC estimation. Despite its empirical effectiveness, PC only encodes the low-order (i.e., second-order) statistics by calculating the pairwise correlations between network nodes (brain regions), which fails to capture the high-order information involved in FC (e.g., the correlations among different edges in a network). To address this issue, we propose a novel FC estimation method based on Matrix Variate Normal Distribution (MVND), which can capture both low- and high-order correlations simultaneously with a clear mathematical interpretability. Specifically, we first generate a set of BOLD subseries by the sliding window scheme, and for each subseries we construct a temporal FC network by PC. Then, we employ the constructed FC networks as samples to estimate the final low- and high-order FC networks by maximizing the likelihood of MVND. To illustrate the effectiveness of the proposed method, we conduct experiments to identify subjects with Mild Cognitive Impairment (MCI) from Normal Controls (NCs). Experimental results show that the fusion of low- and high-order FCs can generally help to improve the final classification performance, even though the high-order FC may contain less discriminative information than its low-order counterpart. Importantly, the proposed method for simultaneous estimation of low- and high-order FCs can achieve better classification performance than the two baseline methods, i.e., the original PC method and a recent high-order FC estimation method.

（19）Network Structure and Transfer Behaviors Embedding via Deep Prediction Model

Abstract： Network-structured data is becoming increasingly popular in many applications. However, these data present great challenges to feature engineering due to its high non-linearity and sparsity. The issue on how to transfer the link-connected nodes of the huge network into feature representations is critical. As basic properties of the real-world networks, the local and global structure can be reflected by dynamical transfer behaviors from node to node. In this work, we propose a deep embedding framework to preserve the transfer possibilities among the network nodes. We first suggest a degree-weight biased random walk model to capture the transfer behaviors of the network. Then a deep embedding framework is introduced to preserve the transfer possibilities among the nodes. A network structure embedding layer is added into the conventional Long Short-Term Memory Network to utilize its sequence prediction ability. To keep the local network neighborhood, we further perform a Laplacian supervised space optimization on the embedding feature representations. Experimental studies are conducted on various real-world datasets including social networks and citation networks. The results show that the learned representations can be effectively used as features in a variety of tasks, such as clustering, visualization and classification, and achieve promising performance compared with state-of-the-art models.

（20）Automatic Chinese Postal Address Block Location Using Proximity Descriptors and Cooperative Profit Random Forests

Abstract： Locating the destination address block is key to automated sorting of mails. Due to the characteristics of Chinese envelopes used in mainland China, we here exploit proximity cues in order to describe the investigated regions on envelopes. We propose two proximity descriptors encoding spatial distributions of the connected components obtained from the binary envelope images. To locate the destination address block, these descriptors are used together with cooperative profit random forests (CPRFs). Experimental results show that the proposed proximity descriptors are superior to two component descriptors, which only exploit the shape characteristics of the individual components, and the CPRF classifier produces higher recall values than seven state-of-the-art classifiers. These promising results are due to the fact that the proposed descriptors encode the proximity characteristics of the binary envelope images, and the CPRF classifier uses an effective tree node split approach.

（21）The Visual Word Booster: A Spatial Layout of Words Descriptor Exploiting Contour Cues

Abstract： Although researchers have made efforts to use the spatial information of visual words to obtain better image representations, none of the studies take contour cues into account. Meanwhile, it has been shown that contour cues are important to the perception of imagery in the literature. Inspired by these studies, we propose to use the spatial layout of words (SLoW) to boost visual word based image descriptors by exploiting contour cues. Essentially, the SLoW descriptor utilises contours and incorporates different types of commonly used visual words, including hand-crafted basic contour elements (referred to as contons), textons, and scale-invariant feature transform words, deep convolutional words and a special type of words: local binary pattern codes. Moreover, SLoW features are combined with spatial pyramid matching (SPM) or vector of locally aggregated descriptors (VLAD) features. The SLoW descriptor and its combined versions are tested in different tasks. Our results show that they are superior to, or at least comparable to, their counterparts examined in this paper. In particular, the joint use of the SLoW descriptor boosts the performance of the SPM and VLAD descriptors. We attribute these results to the fact that contour cues are important to human visual perception and, the SLoW descriptor captures not only local image characteristics but also the global spatial layout of these characteristics in a more perceptually consistent way than its counterparts.

（22）Identifying Advisor-advisee Relationships from Co-author Networks via a Novel Deep Model

Abstract： Advisor-advisee is one of the most important relationships in research publication networks. Identifying it can benefit many interesting applications, such as double-blind peer review, academic circle mining, and scientific community analysis. However, the advisor-advisee relationships are often hidden in research publication network and vary over time, thus are difficult to detect. In this paper, we present a time-aware Advisor-advisee Relationship Mining Model (tARMM) to better identify such relationships. It is a deep model equipped with improved Refresh Gate Recurrent Units (RGRU). Extensive experiments over real-world DBLP data have well verified the effectiveness of our proposed model.

（23）Group-Pair Convolutional Neural Networks for Multi-View based 3D Object Retrieval

Abstract： In recent years, research interest in object retrieval has shifted from 2D towards 3D data. Despite many well-designed approaches, we point out that limitations still exist and there is tremendous room for improvement, including the heavy reliance on hand-crafted features, the separated optimization of feature extraction and object retrieval, and the lack of sufficient training samples. In this work, we address the above limitations for 3D object retrieval by developing a novel endto-end solution named Group Pair Convolutional Neural Network (GPCNN). It can jointly learn the visual features from multiple views of a 3D model and optimize towards the object retrieval task. To tackle the insufficient training data issue, we innovatively employ a pair-wise learning scheme, which learns model parameters from the similarity of each sample pair, rather than the traditional way of learning from sparse label–sample matching. Extensive experiments on three public benchmarks show that our GPCNN solution significantly outperforms the state-of-the-art methods with 3% to 42% improvement in retrieval accuracy.

（24）Learning Deconvolutional Deep Neural network for High Resolution Medical Image Reconstruction

Abstract： Super resolution reconstruction can be used to recover a high resolution image from a low resolution image and is particularly beneficial for clinically significant medical images in diagnosis, treatment, and research applications. However, super resolution is a challenging inverse problem due to its ill-posed nature. In this paper, inspired by recent developments in deep learning, a super resolution algorithm (SR-DCNN) is proposed for medical images that is based on a neural network and employs a deconvolution operation. The purpose of the deconvolution is to effectively establish an end-to-end mapping between the low and high resolution images. First, training data consisting of 1500 medical images of the lung, brain, heart, and spine, was collected, down-sampled, and input into the neural network. Then, patch-based image features were extracted using a set of filters and the parametric rectified linear unit (PReLU) was subsequently applied as the activation function. Finally, these extracted image features were used to reconstruct high resolution images by minimizing the loss between the predicted output image and the original high resolution image. Various network structures and hyper parameter settings were explored to achieve a good trade-off between performance and computational efficiency, based on which a four-layer network was found to achieve the best result in terms of the peak signal-to-noise ratio (PSNR), structural similarity measure (SSIM), information entropy (IE), and execution speed. The network was then validated on test data, and it was demonstrated that the proposed SR-DCNN algorithm quantitatively and qualitatively outperformed the current state-of-the-art methods.

（25）Patch-Based Image Inpainting via Two-Stage Low Rank Approximation

Abstract： To recover the corrupted pixels, traditional inpainting methods based on low-rank priors generally need to solve a convex optimization problem by an iterative singular value shrinkage algorithm. In this paper, we propose a simple method for image inpainting using low rank approximation, which avoids the time-consuming iterative shrinkage. Specifically, if similar patches of a corrupted image are identified and reshaped as vectors, then a patch matrix can be constructed by collecting these similar patch-vectors. Due to its columns being highly linearly correlated, this patch matrix is low-rank. Instead of using an iterative singular value shrinkage scheme, the proposed method utilizes low rank approximation with truncated singular values to derive a closed-form estimate for each patch matrix. Depending upon an observation that there exists a distinct gap in the singular spectrum of patch matrix, the rank of each patch matrix is empirically determined by a heuristic procedure. Inspired by the inpainting algorithms with component decomposition, a two-stage low rank approximation (TSLRA) scheme is designed to recover image structures and refine texture details of corrupted images. Experimental results on various inpainting tasks demonstrate that the proposed method is comparable and even superior to some state-of-the-art inpainting algorithms.

五、大会承办、赞助单位简介

山东大学简介

山东大学是一所历史悠久、学科齐全、学术实力雄厚、办学特色鲜明，在国内外具有重要影响的教育部直属重点综合性大学，是世界一流大学建设高校（A 类）。

山东大学是中国近代高等教育的起源性大学。其医学学科起源于 1864 年，开启近代中国高等医学教育之先河。其主体是 1901 年创办的山东大学堂，是继京师大学堂之后中国创办的第二所国立大学，也是中国第一所按章程办学的大学。从诞生起，学校先后历经了山东大学堂、国立青岛大学、国立山东大学、山东大学以及由原山东大学、山东医科大学、山东工业大学三校合并组建的新山东大学等几个历史发展时期。百余年间，山东大学秉承“为天下储人才，为国家图富强”的办学宗旨，践行“学无止境，气有浩然”的校训，踔厉奋发，薪火相传，形成了“崇实求新”的校风，为国家和社会培养了 40 余万各类人才，为国家和区域经济社会发展做出了重要贡献。

近年来山东大学实现了跨越式发展，各项事业均达到了前所未有的高度。学校的综合水平和办学质量明显提升，国际影响力显著增强，目前有 15 个学科的学术影响力和贡献能力进入 ESI 世界排名前 1%，与 30 多个国家和地区的近 170 所学校签署了校际合作协议。

学校汇聚了一批杰出人才，共有教授 1246 人，博士生导师 897 人。其中，诺贝尔物理学奖获得者 Peter Grünberg 受聘为特聘教授，研究生导师莫言教授荣获 2012 年诺贝尔文学奖。学校现有中国科学院和工程院院士 7 人，双聘院士 63 人，终身教授 9 人，人文社科一级教授 16 人；“千人计划”国家特聘教授 33 人、“青年千人计划”入选者 33 人；“长江学者奖励计划”特聘教授 30 人、讲座教授 15 人、青年项目入选者 3 人；国家杰出青年科学基金获得者 37 人、优秀青年科学基金获得者 22 人；“万人计划”领军人才 15 人、教学名师 5 人、青年拔尖人才 10 人；国家百千万人才工程入选者 29 人；泰山学者攀登计划入选者 9 人、泰山学者特聘教授（专家）108 人、泰山学者青年专家 18 人。

山东财经大学简介

山东财经大学是财政部、教育部、山东省共建高校，坐落于名泉喷涌的国家历史文化名城——济南，是一所办学历史悠久、办学规模较大、办学特色鲜明，以经济学和管理学科为主，兼有文学、法学、理学、工学、教育学、艺术学八大学科门类，在国内外有一定影响力和美誉度的省属财经类高校。

学校是目前全国在学规模最大的财经类大学，有全日制在校本科生、研究生 33000 余人。设有 24 个教学院（部），60 个本科专业。拥有应用经济学、工商管理、管理科学与工程、统计学 4 个一级学科博士学位授权点；10 个一级学科硕士学位授权点；拥有工商管理硕士（MBA）、公共管理硕士（MPA）等 14 种硕士专业学位类别。2016 年，应用经济学、管理科学与工程两个学科入选山东省一流学科；同时，学校确定了 19 个校级一流学科立项建设学科。信息管理与信息系统、金融学入选山东省高水平应用型重点立项建设专业（群）；会计学专业群、国际商务专业群、计算机科学与技术专业群、数学与应用数学专业群、行政管理专业群获批山东省自筹经费立项建设高水平应用型专业（群）。 2017 年 12 月 28 日，教育部学位与研究生教育发展中心公布了第四轮学科评估结果。两个一级学科应用经济学、工商管理为 B+，两个一级学科管理科学与工程、公共管理为 B-，成为有两个以上 B+学科的三所山东省属高校之一，成为山东省唯一拥有 B 以上经管学科的省属高校，整体学科实力进入全国财经高校前十名。

学校拥有一支高水平的师资队伍。现有专任教师 1899 人，其中教授、副教授 993 人，具有硕士以上学位的 1555 人，其中具有博士学位的 748 人。教师中有国家级有突出贡献的专家 3 人，享受国务院政府特殊津贴的专家 15 人，“泰山学者”特聘教授 8 人，“泰山学者”青年专家 3 人，入选“百千万人才工程”国家级 2 人，入选教育部新世纪人才支持计划 2 人，山东省有突出贡献的中青年专家 12 人，山东省高层次人才库 19 人，全国优秀教师 9 人，省级教学名师 16 人，博士生导师 44 人。2016 年，7 名教授入选山东首批智库高端人才名单。

杭州海康威视数字技术股份有限公司简介

海康威视是以视频为核心的物联网解决方案提供商，面向全球提供综合安防、智慧业务与大数据服务。

海康威视全球员工超 26000 人(截止 2017 年底),其中研发和技术服务人员超 13000 人，研发投入占企业销售额的 7-8%，绝对数额占据业内前茅。海康威视是博士后科研工作站单位，以杭州为中心，建立辐射北京、上海、重庆、武汉、新疆以及加拿大蒙特利尔、美国硅谷和英国利物浦的研发中心体系，并计划在西安、武汉、成都、重庆和石家庄建立新的研发基地。海康威视拥有视音频编解码、视频图像处理、视音频数据存储等核心技术，及云计算、大数据、深度学习等前瞻技术，并将业务延伸到智能家居、工业自动化和汽车电子等行业，为持续发展打开新的空间。

海康威视在中国大陆 35 个城市设立分公司及售后服务站，在境外，设立 37 个分支机构（截止 2017 年 12 月 30 日）。海康威视产品和解决方案应用在 150 多个国家和地区，在 G20 杭州峰会、北京奥运会、上海世博会、APEC 会议、荷兰阿贾克斯、缅甸智能交通、丹麦机场等重大安保项目中发挥了极其重要的作用。

海康威视是全球视频监控数字化、网络化、高清智能化的见证者、践行者和重要推动者。连续六年（2011-2016）蝉联 iHS 全球视频监控市场占有率第 1 位 ；连年入选“国家重点软件企业” 、“中国软件收入前百家企业” 、A&S《安全自动化》“中国安防十大民族品牌”、CPS 《中国公共安全》“中国安防百强”（位列榜首）；2016-2017 年，A&S《安全自动化》公布的“全球安防 50 强”榜单中，蝉联全球第 1 位。

海康威视秉承“专业、厚实、诚信”的经营理念，坚持将“成就客户、价值为本、诚信务实、追求卓越”核心价值观内化为行动准则，不断发展视频技术，服务人类。

山东联科云计算股份有限公司简介

山东联科云计算股份有限公司成立于 2014 年 3 月，注册资本 2400 万元，于 2017 年 9 月 28 日在新三板挂牌上市，股票代码：872219，股票简称：联科云。联科云是一家提供云计算和大数据分析方向产品和服务的高科技公司，是国家高新技术企业，双软企业和软件服务业企业。公司坚持“以创新技术为客户创造价值”，致力于成为云计算大数据的全球领跑者。

（1）合作伙伴

联科云与国内外知名企业华为、联想、金蝶软件、宏碁集团、清华同方等达成合作伙伴关系。另外，公司在云计算、数据处理系列产品的研发、发展平台上先后与香港浸会大学、同济大学、复旦大学、山东大学、山东财经大学、济南大学、武汉大学、湖北工业大学等高等院校开展了合作。2017 年 6 月，联科云与山东省枣庄市高新区政府签订了“鲁南大数据人才培养孵化基地项目战略合作协议”，双方将在产业规划、人才引进、项目引进、专项申报、企业孵化等方面展开全面合作。

（2）核心业务

联科云围绕用户对云计算和大数据的智能管理与分析需求，依托自主创新的核心技术和行业多年的经验积累，为政府、企业、互联网等不同行业、不同领域的客户提供包括云计算和大数据软件、硬件、服务的行业整体解决方案。

（3）研发实力

公司拥有世界最新一代的专利算法和构架设计，可显著提升软件运算管理水平，运算速度提升 10～100 倍，此项技术已广泛应用到海量数据处理、大规模计算、深度分析、人工智能等众多领域。在超级计算方面，公司拥有自主研发的算法库，在银行、保险、零售、公安、法院、税务、社保等行业，具有多年的挖掘分析经验。公司自成立以来不断在技术和应用上进行创新和突破，研发水平达到国际级，拥有国内外顶级专家的建模技术和多个行业的数据挖掘模型及落地方案。

（4）服务领域

联科云主要为客户提供基于公共云、私有云和混合云的大数据解决方案，服务领域涉及金融工程、商业智能、环境科技、智慧城市、物联网应用、健康医疗等。联科云计算拥有多个可落地的行业解决方案，可为这些客户提供从软件、设备到应用服务的整体解决方案。

（5）省内唯一一家工信部大数据工程师培训认证机构

在当今软件信息行业持续增长、云计算市场高速发展的大背景下，联科云凭借多年的行业积累、领先的产品技术构架、优秀的高端技术人才、完备的企业资质认证，在众多新兴高科技企业中独树一帜。目前，联科云全面开展大数据人才培养与认证服务，成为山东省内唯一一家由国家工信部授权的大数据分析师、大数据工程师培训认证机构。

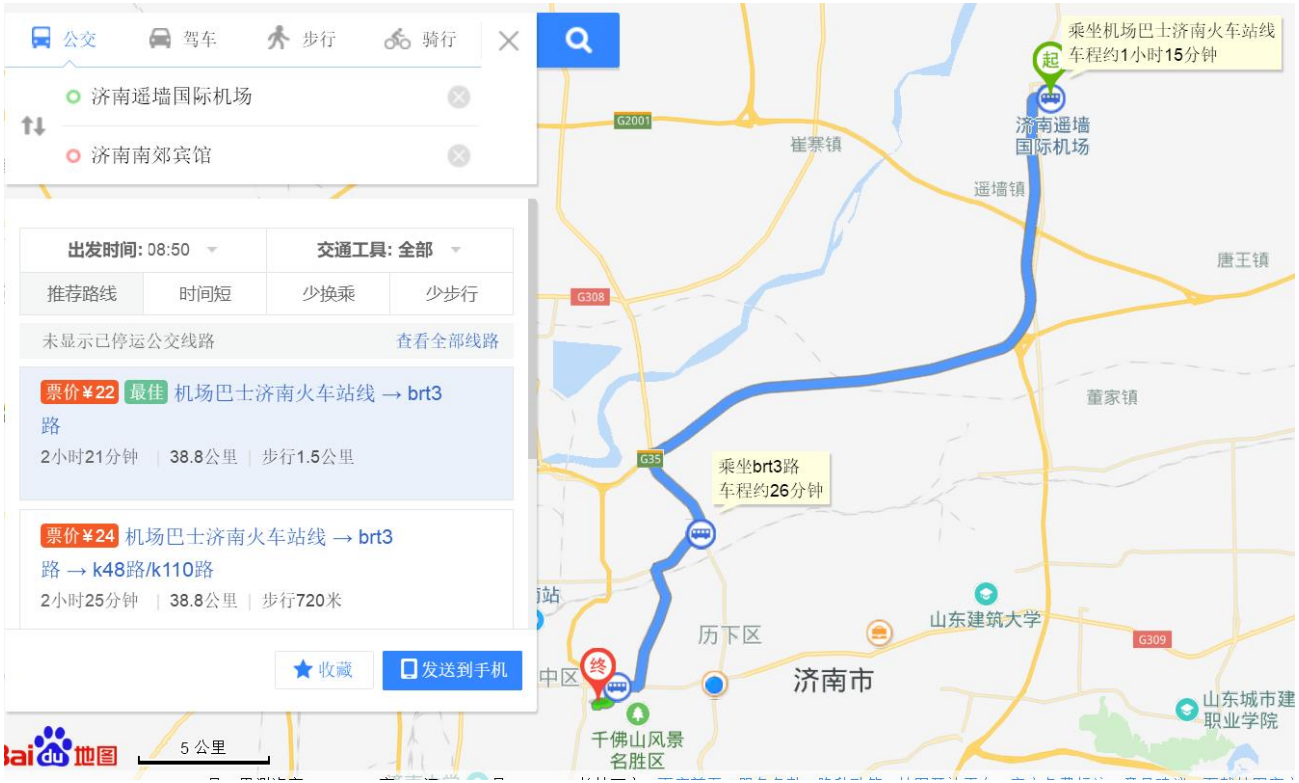
六、会场交通

济南遥墙机场-->济南南郊宾馆：

出租：机场距南郊宾馆约 40 公里，耗时约 57 分钟；

公交：线路 1：机场巴士济南火车站线→BRT3 路。耗时约 2 小时 19 分钟。济南遥墙国际机场站乘坐机场巴士，至全福立交桥站下车，步行 10 米至全福立交桥西站转乘 BRT3 路，至经十路舜耕路站下车，步行 1.3 公里到达终点。

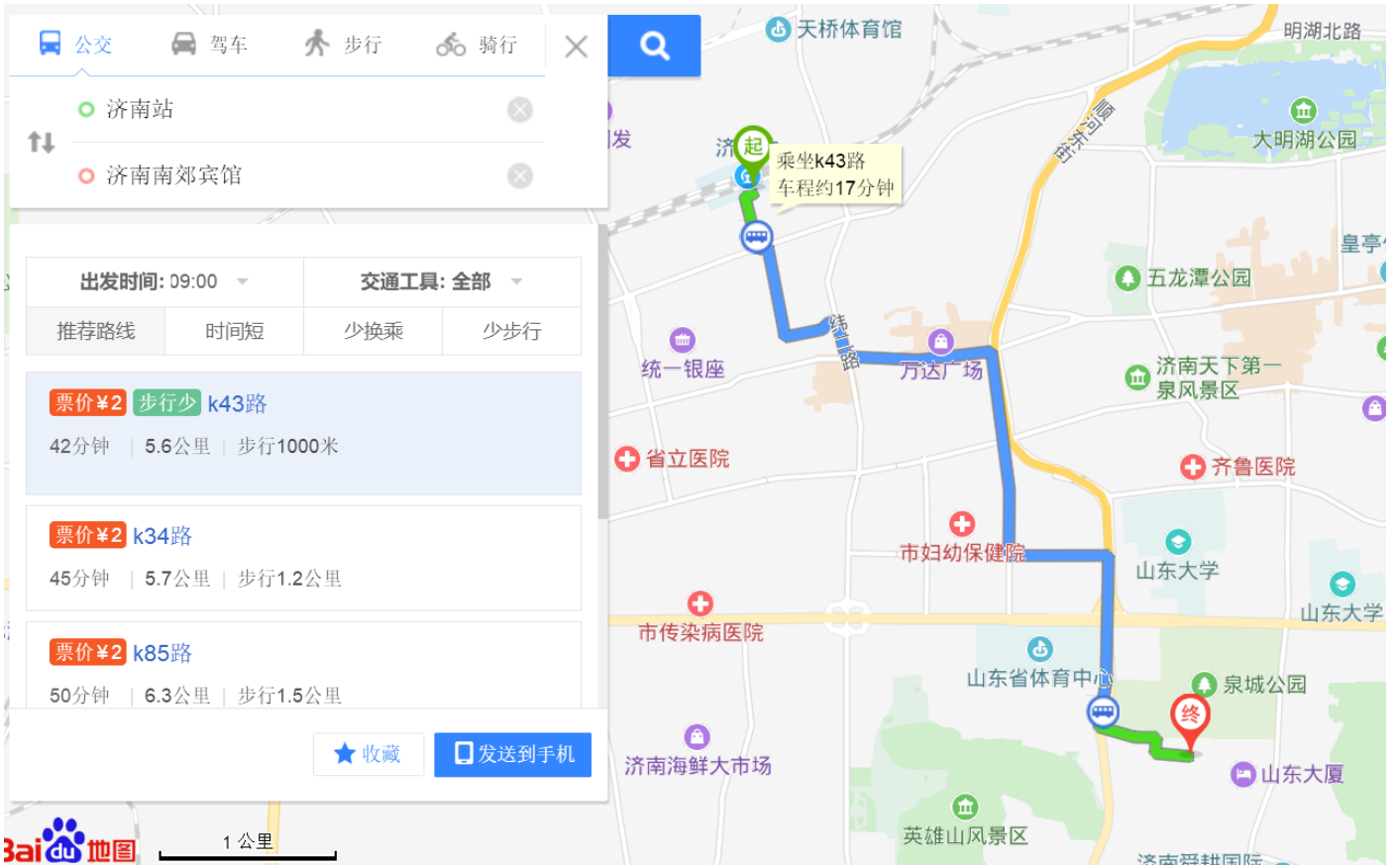
线路 2：机场巴士济南火车站线 → 75 路。耗时约 2 小时 30 分钟。济南遥墙国际机场站乘坐机场巴士，至全福立交桥站下车，步行 250 米至全福立交桥南转乘 75 路，至省体育中心东站下车，步行 630 米到达终点。



济南火车站-->济南南郊宾馆：

出租：济南火车站距南郊宾馆约 6 公里，耗时约 20 分钟；

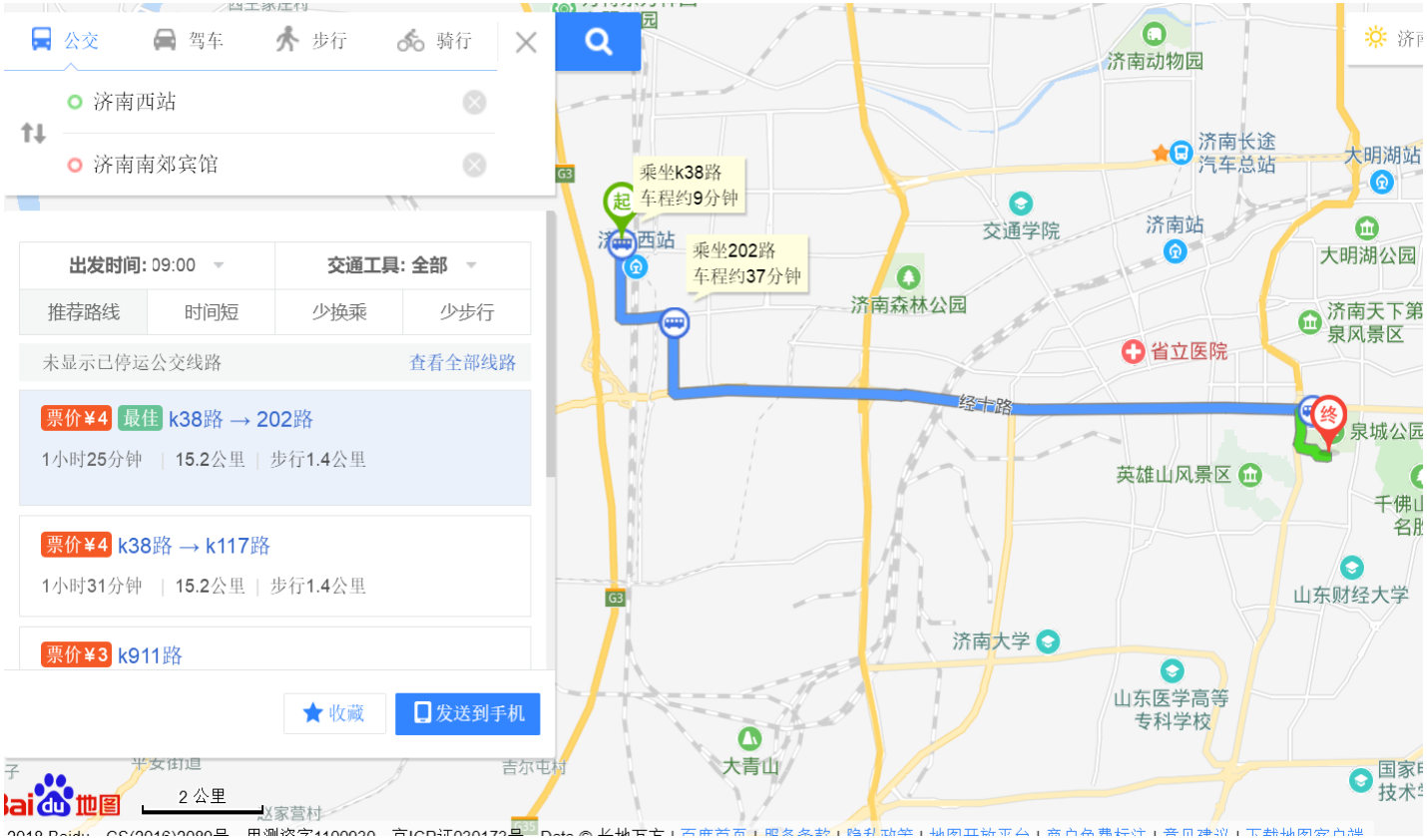
公交：线路 1：K43 路，耗时约 40 分钟。从火车站出口步行 290 米火车站站上车，省体育中心东站下车，步行 640 米到达终点。



济南西站-->济南南郊宾馆：

出租：济南西客站距南郊宾馆约 16 公里，耗时约 37 分钟；

公交：线路 1：K38 路→K911 路/202 路，耗时约 1 小时 25 分钟。步行 10 米至济南西站乘坐 K38 路公交车，至大金新苑站下车，在大金新苑站乘坐 K911 路（或 202 路），至全民健身中心站下车，步行 1.3 公里到达终点。



线路 2：K911 路，耗时约 1 小时 26 分钟。步行 850 米至高铁西站（长途汽车西站）站上车，至全民健身中心站下车，步行 1.3 公里到达终点。

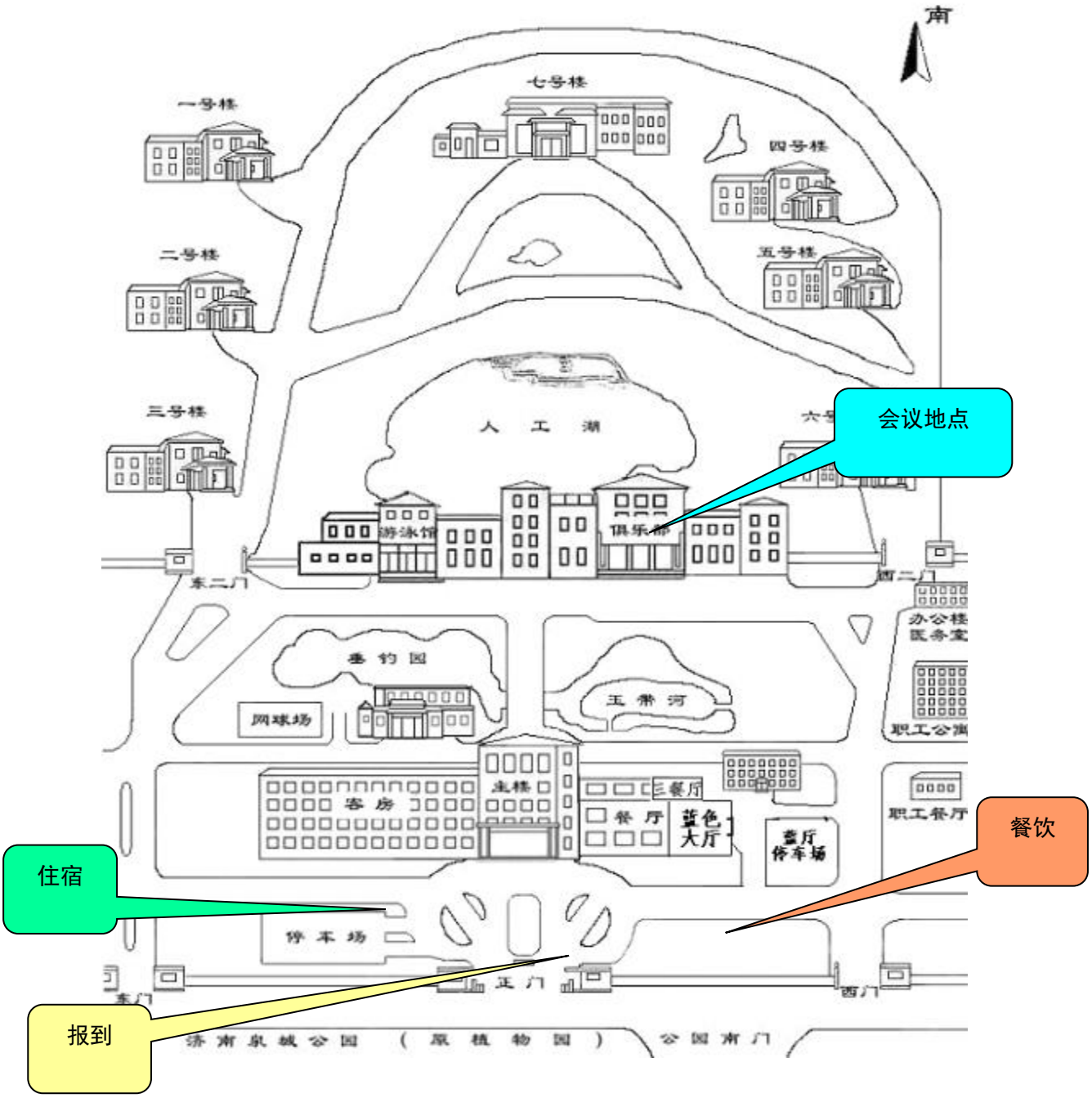
七、会务组联系方式

联系人：崔超然、聂秀山

联系电话：18560132126，18615427837

联系邮箱：SDAI2018@163.com

八、济南南郊宾馆平面图


南
一号楼
二号楼
三号楼
四号楼
五号楼
七号楼
人 工 湖
游泳馆
俱乐部
东二门
西二门
垂 钓 园
网球场
玉 带 河
办公楼
医务室
职工公寓
主楼
客 房
餐 厅
三餐厅
蓝色大厅
蓝厅停车场
职工餐厅
停 车 场
东门
正 门
西门
济南泉城公园 （ 原 植 物 园 ） 公园南门
会议地点
餐饮
住宿
报到