**交通系统分析青年论坛（哈尔滨）**

**2018年12月28日 （地点：交通学院314会议室）**

**8:30-9:00**

学院领导致辞（欢迎词、学校和学院简介）

**9:00-10:20**

**郭仁拥：**北京航空航天大学经济管理学院教授

报告题目：公交应急疏散：真实数据和模型仿真结果

**谭志加：**大连海事大学航运经济与管理学院兴海特聘教授

报告题目：Network and Frequency Design for Bus Bridging Service Considering Passengers’ Heterogeneous Risk-taking Behavior

**10:20-10:40** （茶歇）

**10:40-12:00**

**王晓蕾：**上海交通大学中美物流研究院副研究员

报告题目：Driver-rider Cost-Sharing Strategies and Equilibria in a Ridesharing Program

**要甲：**哈尔滨工业大学交通科学与工程学院副教授

报告题目：Paradox Links Can Improve System Efficiency: an Illustration in Traffic Assignment Problem

**12:00-13:30** （午餐）

**13:30-18:00**

参加学院60周年庆活动和市区游览

**18:00-20:00** （晚餐）

**2018年12月29日 （地点：交通学院304会议室）**

**8:20-10:20**

**王震：**西北工业大学教授

报告题目：Data Science: From small to big---Exploring the human behavior and response in data science

**陈喜群：**浙江大学建筑工程学院“百人计划”研究员

报告题目：Understanding On-Demand Ride Services: Platform Optimization, Network Evaluation, Behavioral Analysis, and Traffic Prediction

**徐素秀：**暨南大学工业工程系教授

报告题目：To automate or not to automate: That is the question for ecommerce warehousing

**10:20-10:40** （茶歇）

**10:40-12:00**

**谢军：**西南交通大学运输与物流学院副教授

报告题目：Understanding mass transit attractiveness to taxi travelers with a data-driven modeling framework: A case study of Shenzhen, China

**简思思：**澳大利亚新南威尔士大学副研究员

报告题目：Understanding and Optimizing Carsharing Systems

**12:00-13:30** （午餐）

**邀请报告人简介：**

**郭仁拥：**北京航空航天大学经济管理学院教授、博士生导师。 主要从事交通行为建模与分析、城市经济学、社会计算、运筹学、城市大数据计算与处理等的研究。已在 Transportation Research Part B和Part C、Transportation Science、Journal of Statistical Mechanics、Physical Review E、Networks and Spatial Economics等期刊发表学术论文60余篇，其中40余篇被 SCI/SSCI检索。主持国家自然科学基金项目4项、教育部“新世纪优秀人才支持计划”项目1项。现担任交通科学领域顶级期刊Transportation Research Part B编委、中国系统工程学会第十届理事会理事、管理科学与工程学会交通运输管理研究会委员、中国管理现代化研究会管理与决策科学专业委员会常务理事等。

**报告题目：**公交应急疏散：真实数据和模型仿真结果

**摘要：**利用真实的突发事件视频记录，我们研究了公交车厢内乘客的应急疏散过程，并建立一个空间细划的微观行人模型，来再现该场景中的行人疏散过程。我们的贡献主要在三方面：第一，通过分析视频记录，发现了该场景中疏散乘客的一些定性和定量行为和特征；第二，基于观察到的行为特征，建立了一个势能驱动的微观行人仿真模型，开仿真该场景中的疏散过程；第三，通过比较模型仿真结果和真实数据，验证和校正了所建立的行人模型。

**谭志加：**大连海事大学航运经济与管理学院兴海特聘教授。谭教授博士毕业于香港科技大学，现为大连海事大学航运经济与管理学院兴海特聘教授、博士生导师、综合交通运输协同创新中心副主任，研究方向包括：高速公路特许经营合同经济理论研究、交通系统建模与分析、内河班轮设计与港口竞合理论等，研究成果发表在Transportation Research Part B&C&E、Transportation Science、管理科学学报等期刊，目前在PPP学术理论方面倾向于数据驱动型特许经营合同理论模型分析、政府管制机制设计、项目群遴选与投资时机决策等。

**报告题目：**Network and Frequency Design for Bus Bridging Service Considering Passengers’ Heterogeneous Risk-taking Behavior

**摘要：**This paper develops the disutility-based model to study the bus bridging service including evacuation bus network design and frequency optimization under common metro service disruptions. The disutility model can capture the uncertainty of the recovery time of the disruptions and risk-taking heterogeneity of the affected passengers facing the disruptions. The proposed model can provide the explicit estimation on the evacuation passenger number between each metro OD pair and joint network-frequency design, which builds the linkage between the behavior of passengers’ transit route choice and bus bridging service. The bus bridging scheme design problem, i.e., the joint network design and frequency optimization, can be modeled as the pure integer nonlinear programming problem. We also propose a heuristic algorithm based on the idea of the steepest descent method to solve the problem. The efficiency of the proposed model and method are demonstrated by the numerical experiment with a real urban transit network.

**王晓蕾：**上海交通大学中美物流研究院副研究员，2012年博士毕业于香港科技大学，主要的研究方向为：可交易通行权机制设计、共享出行平台定价优化和共享出行下的城市交通系统管理。在SCI/SSCI检索的国际期刊上发表论文15篇，其中有7篇发表在交通领域顶级期刊Transportation Research Part B和Transportation Science上。

**报告题目：**Driver-rider Cost-Sharing Strategies and Equilibria in a Ridesharing Program

**摘要：**The rapid development of smartphone technology has led to the increased popularity of dynamic ridesharing apps used to organize ad hoc ridesharing trips between strangers at short notice. To support such real-time on-demand services, cost-sharing between drivers and riders is commonly centrally determined by ridesharing apps according to prescribed rules. To highlight the impacts of appropriate cost-sharing strategies on the success of ridesharing programs, this paper models the mode choices of a group of heterogeneous travelers with continuously distributed values of time in a single-corridor network, considering the complex interactions between travelers’ mode choices and the attractiveness of ridesharing in terms of rider/driver waiting/detouring times and matching probabilities. The equilibrium state under any given cost-sharing strategy is described by a system of variational inequalities, based on which the existence of equilibria is established. With the proposed modeling framework, various cost-sharing strategies are examined to avoid mode shifts among transit users to autos and/or reduce vehicular traffic in the short run, and the necessary conditions for cost-sharing strategies to sustain participation and/or reduce vehicle usage are explicitly provided. It is shown that when driving alone is faster but more expensive than public transit, no cost-sharing strategy exists to sustain an active ridesharing platform without inducing transit users to join the ridesharing program. Moreover, the existence of cost-sharing strategies capable of reducing vehicular traffic on the road is not always guaranteed, depending on the costs of driving alone and taking public transit in the considered corridor, fuel prices, and travelers’ prioritization of safety and privacy. Furthermore, it is found that the initial state with no ridesharing participants is an equilibrium under any cost-sharing strategy if the additional cost incurred by a traveler through participating in a ridesharing program is non-negative. This explains the difficulty of initiating a ridesharing program and implies the initial necessity of subsidizing all intended riders and/or drivers to encourage participation.

**要甲：**哈尔滨工业大学交通科学与工程学院副教授。2014年入选哈工青年拔尖人才选聘计划，主持国家自然科学基金面上项目、青年项目、中国博士后科学基金面上项目和国际交流计划派出项目、CCF-滴滴大数据联合实验室盖亚青年学者项目等。研究领域包括网络交通流理论、交通系统可靠性、公交优先策略和交通大数据分析，研究成果发表在：Transportation Research Part B&C、Transport Policy、Transportmetrica A、European Journal of Operational Research、Journal of Transportation Engineering等国际顶级/权威期刊。目前，担任世界交通运输大学（WTC）交通工程学部“交通网络设计”技术委员会主席。

**报告题目：**Paradox Links Can Improve System Efficiency: an Illustration in Traffic Assignment Problem

**摘要：**This study demonstrates a counter-intuitive phenomenon that “paradox links” (i.e. adding or marginally improving these links will increase a system’s cost) can sometimes decrease a system’s cost. First, we illustrate that the paradox caused by marginally improving a link could disappear when continuing to improve that link to a certain threshold in a stochastic traffic assignment. Next, for paradox links that result in a paradox when independently added to a network, simultaneously adding these paradox links to a network may counter-intuitively avoid the paradox. This phenomenon is referred to as the “non-monotonicity” of the paradox with regard to the degree of link improvement and the number of additional paradox links. Using two example networks, we demonstrate that this phenomenon widely exists in stochastic assignment, user equilibrium, and stochastic user equilibrium (using the multinomial Logit model). The underlying reasons for this phenomenon in different traffic assignment models were analyzed and compared. Finally, the non-monotonicity of the traffic paradox was corroborated in a road sub-network of Harbin, in which the multinomial Probit model was also used to consider route overlapping. The conclusions of this study provide new insights into features of traffic paradoxes and new ideas to eliminate them.

**王震：**西北工业大学教授，陕西省高层次人才发展促进会副秘书长，日本学术振兴会(JSPS)特约专家，国外多所大学荣誉教授和客座教授。其主要研究方向包括网络科学、大数据、博弈论、行为决策等学方面的研究。目前，已在Physics Reports、Nature Communications、Proceedings of the National Academy of Sciences (PNAS)、Science Advances、IEEE 汇刊等国际知名SCI期刊发表论文100余篇(其中ESI高被引论文30篇，Hot论文10余篇)，引用8000余次，H因子43。他的研究工作多次被美国科学院院士、欧洲科学院院士、AAAS Fellow、APS Fellow、IEEE Fellow、SIAM Fellow、AMS Fellow等国际知名学者在Nature、Science、PNAS等国际知名杂志引用和正面评价。近五年，受邀在国外知名研究机构和国际顶级会议做大会报告和特邀报告60余次。研究成果被Science、Nature News、LiveScience、ScienceDaily、Phys.Org.、科学通报、中国科学、科学网等30多家国内外知名学术媒体专题报道。目前获得多项荣誉和科研奖励：2018年《科学中国人》“杰出青年科学家奖”，2017年获首届《麻省理工科技评论》“中国35岁以下科技创新青年奖” (MIT Technology Review (China) Innovators Under 35)，多次获省部级、学会一等奖，多次获得Elsevier和IOP的年度最佳论文、年度亮点论文、最多下载论文、最多引用论文、Elsevier年度杰出审稿人。

**报告题目：**Data Science: From small to big---Exploring the human behavior and response in data science

**摘要：**One of the most elusive scientific challenges for over 150 years has been to explain why cooperation survives despite being a seemingly inferior strategy from an evolutionary point of view. Over the years, various theoretical scenarios aimed at solving the evolutionary puzzle of cooperation have been proposed, eventually identifying several cooperation-promoting mechanisms: kin selection, direct reciprocity, indirect reciprocity, network reciprocity, and group selection. We report the results of repeated Prisoner’s Dilemma experiments with anonymous and onymous pairwise interactions among individuals. We find that onymity significantly increases the frequency of cooperation and the median payoff per round relative to anonymity. Furthermore, we also show that the correlation between players’ ranks and the usage of strategies (cooperation, defection, or punishment) underwent a fundamental shift, whereby more prosocial actions are rewarded with a better ranking under onymity. Our findings prove that reducing anonymity is a valid promoter of cooperation, leading to higher payoffs for cooperators and thus suppressing an incentive—anonymity—that would ultimately favor defection.

**陈喜群：**浙江大学建筑工程学院土木工程系副系主任，“百人计划”研究员，博士生导师，浙江省杰出青年基金获得者，入选中国科协“青年人才托举工程”。围绕交通态势演化机理与供需调控优化核心科学问题，在交通流动态随机演化机理、交通仿真优化与大数据融合分析、网约共享出行系统优化建模等三个方面展开研究。主持国家自然科学基金2项。在M&SOM、Transportation Science、Transportation Research系列、IEEE TITS等期刊发表SCI/SSCI 检索论文58 篇，由Springer 出版英文专著1 部，参编3 部。获IEEE 国际智能交通学会最佳博士论文奖、国内外学术会议最佳论文奖5 项、中国智能交通协会科学技术二等奖1 项（排第一）。担任WTC 交通工程学部交通运营与管理学科主席、2 个国际期刊编委和客座编辑、8 个国际会议领域编辑和程序委员。

**报告题目：**Understanding On-Demand Ride Services: Platform Optimization, Network Evaluation, Behavioral Analysis, and Traffic Prediction

**摘要：**This presentation focuses on the ridesourcing system optimization modeling and behavioral analysis of the shared mobility on demand. The on-demand ride service platform, e.g., Urber, Lyft, DiDi Chuxing, is an emerging technology with the boom of the mobile internet. Ridesourcing or transportation network companies (TNCs) refer to an emerging urban mobility service mode that private car owners drive their own vehicles to provide for-hire rides. The platform serves as a coordinator who matches requesting orders from passengers (demand) and vacant registered cars (supply). There exists an abundance of leverages to influence drivers’ and passengers’ preference and behavior, and thus affect both the demand and supply, to maximize profits of the platform or achieve the maximum social welfare. The following research efforts have been accomplished by or ongoing in the presenter’s team: (1) On-demand ride services platform and government regulation policy optimization via coordinating supply and demand; (2) Urban road network-wide performance evaluation by exploring real-world emerging ridesourcing order data extracted from DiDi’s platform; (3) Learn on-demand ridesplitting behavior; and (4) Demand/supply/traffic forecasting. Those research initiatives help decision makers better understand the emerging on-demand ride services.

**徐素秀：**暨南大学工业工程系教授。2014年毕业于香港大学工业及制造系统工程系，获哲学博士学位。曾担任香港大学工业及制造系统工程系博士后、讲师。研究方向主要包括：智能物流服务网络优化、拍卖与机制设计、及运营管理。先后主持了国家自然科学基金青年基金项目、珠海市万山区海岛客运规划项目；以第一作者或通讯作者在相关领域发表了近20篇A+ / A类国际期刊论文，其中10篇发表在物流运输及运营管理领域A+类国际期刊，如 Production and Operations Management、Transportation Science、Transportation Research Part B、IISE (IIE) Transactions。

**报告题目：**To automate or not to automate: That is the question for ecommerce warehousing

**摘要：**To pursue high inventory turnover, the ecommerce warehouse operators reckon on the investment of automation. However, there has been a critical hurdle for the small and medium-sized warehouse operators who do not own warehouse properties. When a lease expires, they have to accept a possible rise in rental prices or rent the other warehouses with expensive switching costs. We use economic analysis in a simple game-theory framework to ascertain under what circumstances an ecommerce warehouse operator would outsource the automation service. From the automation provider’s viewpoint, we examine both the choice of service level and the impact of various negotiation powers. Our results demonstrate that in the vertical Nash game where both parties make decisions simultaneously, their profits increase with the sensitivity of the demand to the automation service level but decrease with the sensitivity to the storage price. Surprisingly, it is optimal for the warehouse operator to adopt the non-automatic operation policy in most cases. In the Stackelberg model with the warehouse operator as the leader, if the demand is highly sensitive to the automation service level or not very sensitive to the storage price, then he would choose the automation policy.

**谢军：**西南交通大学运输与物流学院副教授、上海交通大学和美国西北大学博士后。主持国家自然科学基金青年项目、中国博士后科学基金面上项目和国际交流计划派出项目、CCF-滴滴大数据联合实验室盖亚青年学者项目等。研究领域包括：交通均衡分配算法设计、交通大数据分析等，研究成果发表在Transportation Science、Transportation Research Part A&B&C、Transportation Research Record等国际顶级/权威期刊。

**报告题目：**Understanding mass transit attractiveness to taxi travelers with a data-driven modeling framework: A case study of Shenzhen, China

**摘要：**For urban dwellers who have no access to, or otherwise elect not to drive private autos, their medium- and long-distance travel is typically fulfilled by two mobility options: taking public transit or hailing a taxi. When facing the choice between the two, how would a traveler decide? The objective of this study is to examine whether the decision to ride a taxi is indeed driven by cost minimization, and what the answer to the question means for city planners and transit operators. Our research approach is to search for the best transit alternative by applying a hyperpath algorithm to each taxi trip occurred in a city and then compare the travel time, travel distance and the general costs of the two modes. Our case study employs a multitude of data sources collected in Shenzhen, China in 2016. The results show that, even if all taxi riders in Shenzhen earn a high class income (e.g., for people working in the financial sector), 40% of them would be able to lower their general cost if they switch to transit. Even such a rider further values the comfort provided by taxis at 20% of the total general cost, s/he can still benefit from riding transit in 1 out of 5 times on average. Our experiments also generate interesting analytics concerning the performance of the transit system in the city, which indicate that the transit system in Shenzhen is highly accessible and the average travel distance by transit tends to be smaller than that by taxi.

**简思思：**澳大利亚新南威尔士大学副研究员。简思思博士分别于中南大学、新加坡南洋理工大学、澳大利亚新南威尔士大学获得本科、硕士、博士学位，现任新南威尔士大学Research Centre for Integrated Transport Innovations (rCITI) 副研究员、副讲师。简博士主要从事交通网络建模和行为建模方面的研究，研究重点包括：共享出行（拼车、需求响应移动出行）、自动驾驶风险、运输建模中的大数据问题，研究成果发表在Transportation Research Part A&C、Computer-Aided Civil and Infrastructure Engineering、Networks and Spatial Economics等国际顶级/权威期刊。简博士将于明年2月入职香港科技大学土木与环境工程系任助理教授，欢迎对去香港科技大学攻读博士学位感兴趣的学生进行联系。

**报告题目：**Understanding and Optimizing Carsharing Systems

**摘要：**One dominant challenge in carsharing systems is to ensure the supply of vehicles can meet the demand of users in a cost-effective manner. This requires accurately predicting users’ demand and optimally relocating vehicles in response to demand variations. The two principal areas of this study are methods to estimate demand and optimally relocate fleet. From the demand side, this study models users’ vehicle selection and utilization patterns. A spatial hazard-based model and a multiple discrete-continuous extreme value model are proposed to investigate the impacts of users’ attributes and fleet characteristics on their vehicle selection and utilization behavior. These two models are calibrated using data provided by the Australian carsharing company GoGet. The findings can help operators determine the most efficient allocation of resources. From the operation side, this research develops and solves novel models for the vehicle stock imbalance problem in one-way carsharing systems. A relocation model is proposed to link demand and supply. The model incorporates a discrete choice model (DCM) in an integer linear programming (ILP) model to account for the interaction. The results reveal if there is a strong interdependence between demand and supply, the supply has a critical impact on system profit.