



THE ATHENS INSTITUTE FOR EDUCATION AND RESEARCH

Abstract Book

5th Annual International Conference on
Transportation, 3-6 June 2019, Athens,
Greece

Edited by
Gregory T. Papanikos

2019

Abstracts
5th Annual International
Conference on Transportation
3-6 June 2019, Athens, Greece

Edited by Gregory T. Papanikos

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Preface

This book includes the abstracts of all the papers presented at the 5th *Annual International Conference on Transportation (3-6 June 2019)*, organized by the Athens Institute for Education and Research (ATINER).

In total 27 papers were submitted by 30 presenters, coming from 18 different countries (Australia, Brazil, China, Croatia, Cyprus, Czech Republic, France, Germany, Hong Kong, Italy, Poland, Republic of North Macedonia, Singapore, South Africa, Spain, Thailand, UK, and USA). The conference was organized into 9 sessions that included a variety of topic areas such as Traffic Operations and Safety, Emerging Technologies, Maritime Transport and Policy, Educational and Teaching Issues and other. A full conference program can be found before the relevant abstracts. In accordance with ATINER's Publication Policy, the papers presented during this conference will be considered for inclusion in one of ATINER's many publications.

The purpose of this abstract book is to provide members of ATINER and other academics around the world with a resource through which to discover colleagues and additional research relevant to their own work. This purpose is in congruence with the overall mission of the association. ATINER was established in 1995 as an independent academic organization with the mission to become a forum where academics and researchers from all over the world could meet to exchange ideas on their research and consider the future developments of their fields of study.

It is our hope that through ATINER's conferences and publications, Athens will become a place where academics and researchers from all over the world regularly meet to discuss the developments of their discipline and present their work. Since 1995, ATINER has organized more than 400 international conferences and has published nearly 200 books. Academically, the institute is organized into 6 divisions and 37 units. Each unit organizes at least one annual conference and undertakes various small and large research projects.

For each of these events, the involvement of multiple parties is crucial. I would like to thank all the participants, the members of the organizing and academic committees, and most importantly the administration staff of ATINER for putting this conference and its subsequent publications together. Specific individuals are listed on the following page.

Gregory T. Papanikos
President

**5th Annual International Conference on Transportation
3-6 June 2019, Athens, Greece**

Scientific Committee

All ATINER's conferences are organized by the [Academic Council](#). This conference has been organized with the assistance of the following academics, who contributed by a) setting up the program b) chairing the conference sessions, and/or c) reviewing the submitted abstracts and papers:

1. Gregory T. Papanikos, President, ATINER & Honorary Professor, University of Stirling, UK.
2. Virginia Sisiopiku, Head, Transportation Engineering Unit, ATINER, & Associate Professor, The University of Alabama at Birmingham, USA.
3. Nicholas N. Patricios, Vice President of Strategic Planning & Analysis, ATINER and Professor & Dean Emeritus, School of Architecture, University of Miami, USA.
4. Srdjan Vujicic, Professor, University of Dubrovnik, Croatia.
5. Melanie Basantis, Director, Engineering Outreach/Professor, Rowan University, USA.
6. Grigorios Fountas, Lecturer, Edinburgh Napier University, UK.
7. George S. Tsagaris, Associate Professor, Cleveland State University, USA.
8. Richard Jelier, Professor and Director, School of Public, Nonprofit and Health Administration, Grand Valley State University, USA.
9. Jose Miguel Alvarez Romero, PhD Student, Instituto Universitario de Microgravedad "Ignacio Da Riva" (IDR/UPM), Spain.
10. Marijana Pantic, Research Fellow, Institute of Architecture and Urban and Spatial Planning of Serbia, Serbia.

FINAL CONFERENCE PROGRAM
5th Annual International Conference on Transportation, 3-6 June 2019,
Athens, Greece
Conference Venue: Titania Hotel, 52 Panepistimiou Street, 10678 Athens,
Greece

Monday 3 June 2019

07:50-08:40 Registration and Refreshments

08:50-09:20 (Room B - 10th Floor): Welcome and Opening Address by Gregory T. Papanikos, President, ATINER and David Philip Wick, Director, Arts, Humanities & Education Division, ATINER & Professor of History, Gordon College, USA.

09:30-11:00 Session I (Room A - 10th Floor): Project-based Learning

Chair: Virginia Sisiopiku, Head, Transportation Engineering Unit, ATINER, & Associate Professor, The University of Alabama at Birmingham, USA.

1. Sergey Dubikovsky, Associate Professor, Purdue University, USA, Katherine Minarik, Graduate Student, Purdue University, USA & Peng Hao Wang, Assistant Professor, Purdue University, USA. A Correlation between Operational Status of Equipment and Technical Proficiencies of Aeronautical Engineering Technology Students: A Case Study.
2. Gene Hou, Professor, Old Dominion University, USA. Cross-Departmental Collaboration for a Project Based Senior Class: Intelligent Machines.
3. Kian Jon Ernest Chua, Associate Professor, National University of Singapore, Singapore & Md Raisul Islam, Senior Lecturer, National University of Singapore, Singapore. Studying the Effectiveness of Combining Flipped Classroom to an Engineering Project Based Learning Module.
4. Jing Liang, Professor, China University of Mining and Technology, China & Rongli Jiang, Dean, Department of Applied Chemistry, China University of Mining and Technology, China. Developing Students' Critical Thinking, Problem Solving, and Analysis Skills in a Problem-based Organic Synthesis Course.

This session is jointly offered with the Education Unit.

11:00-12:30 Session II (Room B - 10th Floor): Urban Planning Processes and Transportation

Chair: Richard Jelier, Professor and Director, School of Public, Nonprofit and Health Administration, Grand Valley State University, USA.

1. Bun Song Lee, Associate Professor, University of Arkansas - Fort Smith, USA. Characteristics of Cities Encouraging Bus Commuting, Subway Commuting, and Active Commuting (Biking and Walking to Workplaces) in the United States.
2. Rebecca Heckmann, Deputy Project Manager, University of Applied Sciences Stuttgart, Germany & Alexandra Mittelstaedt, Researcher, University of Applied Sciences Stuttgart, Germany. Development of an Emission Calculation Tool for Sustainable Route Planning.
3. Yue Sun, Graduate Student, Southeast University, China. Urban Park Accessibility Evaluation Based on Gravity Model and Realistic Traffic Data: An Example of Baoding.
4. Xiao Zhang, Graduate Student, Southeast University, China. Ecological Resilience Assessment and Optimization Suggestions of Yangtze Middle Reaches Megalopolis.

12:30-14:00 Session III (Room A - 10th Floor): Emerging Technologies

Chair: Srdjan Vujicic, Professor, University of Dubrovnik, Croatia.

1. Grzegorz Sierpinski, Associate Professor, Silesian University of Technology, Poland & Marcin Staniek, Assistant Professor, Silesian University of Technology, Poland. Intelligent Solutions Supporting the Development of Electromobility.
2. Marcin Staniek, Assistant Professor, Silesian University of Technology, Poland & Grzegorz Sierpinski, Associate Professor, Silesian University of Technology, Poland. The Potential and Limitations of Transport System as Factors Affecting the Development of Electromobility.
3. Simon Cohen, Senior Researcher, IFSTTAR, France & Zoi Christoforou, Associate Researcher / Associate Professor, IFSTTAR / Ecole des Ponts ParisTech, France. Travel Time Estimation by Bluetooth and FCD Technologies: A Comparison Study on Motorway.
4. Sheikh Shahriar Ahmed, Graduate Research Assistant, University at Buffalo, The State University of New York, USA, Grigorios Fountas, Lecturer, Edinburgh Napier University, UK, Ugur Eker, Researcher, University at Buffalo, The State University of New York, USA, Stephen E. Still, Professor, University at Buffalo, The State University of New York, USA & Panagiotis Ch. Anastasopoulos, Associate Professor, University at Buffalo, The State University of New York, USA. An Empirical Exploratory Analysis of Potential Residence Relocation Trends from the Future Introduction of Flying Cars.

14:00-15:00 Lunch

15:00-16:30 Session IV (Room A - 10th Floor): Experiential Learning

Chair: George S. Tsagaris, Associate Professor, Cleveland State University, USA.

1. Geok Chin Ivy Tan, Associate Professor, Nanyang Technological University, Singapore. Student-Teachers' Conception and Perception of the Use of the Inquiry-Based Approach in Geography Fieldwork in Singapore.
2. YM Tang, Teaching Fellow, The Hong Kong Polytechnic University, Hong Kong, To Sum Ho, Assistant Professor, The Hong Kong Polytechnic University, Hong Kong & Chun Ho Wu, Assistant Professor, The Hong Kong Polytechnic University, Hong Kong. Engineering Education with Mixed Reality (MR).
3. Jose Miguel Alvarez Romero, PhD Student, Instituto Universitario de Microgravedad "Ignacio Da Riva" (IDR/UPM), Spain, Elena Roibas-Millan, Professor, Instituto Universitario de Microgravedad "Ignacio Da Riva" (IDR/UPM), Spain, Santiago Pindado, Professor, Instituto Universitario de Microgravedad "Ignacio Da Riva" (IDR/UPM), Spain, Javier Pérez-Álvarez, Professor, Instituto Universitario de Microgravedad "Ignacio Da Riva" (IDR/UPM), Spain & Ángel Sanz-Andrés, Professor, Instituto Universitario de Microgravedad "Ignacio Da Riva" (IDR/UPM), Spain. UPMSAT-2 Communications System Design, Integration and Testing, within MUSE (Master in Space Systems) Academic Plan.

This session is jointly offered with the Education Unit.

16:30-18:00 Session V (Room A - 10th Floor): Traffic Operations and Safety

Chair: Jose Miguel Alvarez Romero, PhD Student, Instituto Universitario de Microgravedad "Ignacio Da Riva" (IDR/UPM), Spain.

1. Grigorios Fountas, Lecturer, Edinburgh Napier University, UK, Sarvani Sonduru Pantangi, Graduate Research Assistant, University at Buffalo, The State University of New York, USA, Kevin Hulme, Researcher, University at Buffalo, The State University of New York, USA & Panagiotis Ch. Anastasopoulos, Associate Professor,

- University at Buffalo, The State University of New York, USA. The Effect of Driver's Cognitive States on Observed and Perceived Aggressive Driving Behavior: A Correlated Grouped Random Parameters Approach.
2. Sarvani Sonduru Pantangi, Graduate Research Assistant, University at Buffalo, The State University of New York, USA, Ugur Eker, Graduate Research Assistant, University at Buffalo, The State University of New York, USA, Sheikh Shahriar Ahmed, Graduate Research Assistant, University at Buffalo, The State University of New York, USA, Grigorios Fountas, Lecturer, Edinburgh Napier University, UK, Stephen E. Still, Professor, University at Buffalo, The State University of New York, USA & Panagiotis Ch. Anastasopoulos, Associate Professor, University at Buffalo, The State University of New York, USA. Public Perceptions on Safety Benefits and Security Concerns from the Future Use of Autonomous and Connected Vehicles.
 3. Matheus Zamboni Zaffalon, Student, Federal University of Triângulo Mineiro, Brazil & Viviane Adriano Falcao, Professor, Federal University of Triângulo Mineiro, Brazil. Predicting Passenger Volume of the Regional Airport Mario de Almeida Franco to City-Pairs.

21:00-23:00 Greek Night and Dinner

Tuesday 4 June 2019

08:00-11:00 Session VI: An Educational Urban Walk in Modern and Ancient Athens

Group Discussion on Ancient and Modern Athens.
Visit to the Most Important Historical and Cultural Monuments of the City (be prepared to walk and talk as in the ancient peripatetic school of Aristotle)

11:15-13:00 Session VII (Room B - 10th Floor): Urban Planning Methodologies and Processes, Transportation & Policy

Chair: Marijana Pantic, Research Fellow, Institute of Architecture and Urban and Spatial Planning of Serbia, Serbia.

1. Riste Temjanovski, Professor, Goce Delčev University of Štip, Republic of North Macedonia & Monika Arsova, PhD Student, Goce Delčev University of Štip, Republic of North Macedonia. Transport Policy and Create a Western Balkans Market: How to Mirror the EU's Experience.
2. Martina Sedlakova, Assistant Professor, Czech Technical University in Prague, Czech Republic. Public Space and Artefacts: Several Alterations of Historical Squares in the Czech Republic.
3. Tanapon Panthasen, Assistant Professor, Kasetsart University, Thailand & Supaporn Kaewko Leopairojna, Assistant Professor, Kasetsart University, Thailand. Using the Smart Growth Principles for Real Estate Development around Rapid Transit Stations to Achieve Sustainability.
4. Claudio Meninno, Contract Professor and Postdoctoral Researcher, University of Trieste, Italy. Architecture and Infrastructure: Strategies, Methods and Techniques of Integrated Design for Cross-Border Territorial Development in Europe.
5. Ilaria Geddes, Postdoctoral Researcher, University of Cyprus, Cyprus. Understanding the Mechanisms and Impact of Growth on the Urban Form and Functioning of Cities.

13:00-14:30 Session VIII (Room A - 10th Floor): Special Topics /Teaching Strategies

Chair: Melanie Basantis, Director, Engineering Outreach/Professor, Rowan University, USA.

1. Srdjan Vujicic, Professor, University of Dubrovnik, Croatia, Nermin Hasanspahic, PhD Student, University of Dubrovnik, Croatia, Ana Gundic, Professor, University of Zadar, Croatia & Niko Hrdalo, PhD Student, University of Dubrovnik, Croatia. Assessment for Adequately Qualified Instructors in Maritime Education and Training Institutions.
2. Krystle Ontong, Lecturer, Stellenbosch University, South Africa. Exploring Place and Space as 'Fluid Centres' for Preparing Geography Student Teachers in Becoming Curriculum-Makers.
3. Arthur Firipis, PhD Student, Deakin University, Australia, Siva Chandrasekaran, Lecturer, Swinburne University of Technology, Australia & Matthew Joordens, Lecturer, Deakin University, Australia. Nurturing Creativity through Differentiation while using 1:1 Mobile Devices for Learning?

This session is jointly offered with the Education Unit.

14:30-15:30 Lunch

15:30-16:00 Session IX (Room A - 10th Floor): Maritime Transport

Chair: Grigorios Fountas, Lecturer, Edinburgh Napier University, UK.

1. Dani Sabalja, Assistant Professor, University of Rijeka, Croatia. Contribution to the Advancement of Cruises in the Eastern Mediterranean.

20:00- 21:30 Dinner

**Wednesday 5 June 2019
Mycenae and Island of Poros Visit
Educational Island Tour**

**Thursday 6 June 2019
Delphi Visit**

**Friday 7 June 2019
Ancient Corinth and Cape Sounion**

Sheikh Shahriar Ahmed

Graduate Research Assistant, University at Buffalo, The State University
of New York, USA

Grigorios Fountas

Lecturer, Edinburgh Napier University, UK

Ugur Eker

Researcher, University at Buffalo, The State University of New York, USA

Stephen E. Still

Professor, University at Buffalo, The State University of New York, USA
&

Panagiotis Ch. Anastasopoulos

Associate Professor, University at Buffalo, The State University of New
York, USA

**An Empirical Exploratory Analysis of Potential Residence
Relocation Trends from the Future Introduction of Flying
Cars**

Flying cars, a new transportation mode capable of operating on both land and air, are expected to be introduced in the existing traffic fleet between 2020 and 2025. Due to their capacity to offer flexible mobility patterns and shorter travel time, flying cars are anticipated to bring forth significant changes in the urban transportation network. Even though the launch of flying cars is expected in the near future, potential effects of this new transportation mode on public perceptions towards residence location based on the improved access to mobility, have not been explored in the existing literature. The focus of this paper is to analyze whether the future introduction of flying cars in urban environments is likely to trigger a residence relocation trend from urban to rural areas, or vice versa. Using data collected from an online survey, individuals' opinions towards potential residence relocation are statistically modeled with correlated grouped random parameters probit modeling techniques. The analysis reveals that various socio-demographic characteristics and individuals' opinions towards the perceived benefits and challenges of flying cars affect public opinion towards considering residence relocation from the future introduction of flying cars. Although detailed information regarding the operation of flying cars is limited, the findings from this study can provide insights into the anticipated challenges likely to be faced by policymakers, urban planners, and manufacturing companies, from the future introduction of flying cars.

Jose Miguel Alvarez Romero

PhD Student, Instituto Universitario de Microgravedad "Ignacio Da Riva"
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(IDR/UPM), Spain

Javier Pérez-Álvarez

Professor, Instituto Universitario de Microgravedad "Ignacio Da Riva"
(IDR/UPM), Spain

&

Ángel Sanz-Andrés

Professor, Instituto Universitario de Microgravedad "Ignacio Da Riva"
(IDR/UPM), Spain

**UPMSAT-2 Communications System Design, Integration and
Testing, within MUSE (Master in Space Systems) Academic
Plan**

In recent years, the development of small-size satellites by companies, research institutions and universities have become common practice. This tendency is based on the need for providing an easy and low-cost access to space for those institutions and companies that cannot afford the use of the usual big industrial platforms. In this context, IDR/UPM Institute (*Instituto Universitario de Microgravedad 'Ignacio Da Riva'*) of *Universidad Politécnica de Madrid*, has been developing the UPMSAT-2 microsatellite within the past years. This is one of the most relevant projects in the existing space engineering framework at IDR/UPM, which integrates university professors, research staff of IDR/UPM, and students of the Master in Space Systems (MUSE). Going back to the UPMSAT-2 mission, it should be underlined that this type of small-size satellite requires reliable communication systems able to ensure the quality of the communication link between the satellite and ground control, but they must be also optimized in terms of costs. Therefore, the use of Commercial-Off-The-Shelf (COTS) components, which are normally developed for terrestrial applications, has become a usual practice in such kind of small-size satellite missions. Therefore, these communication subsystems require deep trial campaigns to ensure their proper operation. From this point of view, a proper balance between the limited resources available in this kind of university-satellite missions and the appropriateness of the testing techniques is needed. IDR/UPM professors and MUSE students have performed the full design, manufacture and testing of the UPMSAT-2

communications systems (flight and ground). This paper summarizes the development of the whole UPMSAT-2 communication system, describing the tasks that were required for its implementation, and focusing on how they were harmonized and integrated within the academic plan of the Master in Space Systems (MUSE).

Kian Jon Ernest Chua

Associate Professor, National University of Singapore, Singapore

&

Md Raisul Islam

Senior Lecturer, National University of Singapore, Singapore

Studying the Effectiveness of Combining Flipped Classroom to an Engineering Project Based Learning Module

We evaluate the effectiveness of implementing a combined pedagogy for a group of year-2 Engineering students where fundamental concepts belonging to the flipped classroom (FC) paradigm are applied to a project-based learning (PBL) module. The key aspect of this pedagogy study is to structure most of the engineering basics and mathematical aspects of the subject matter into pre-recorded video lectures, on-line media platforms, learning materials and quizzes. For students exposed to the Project Based Learning - Flipped Classroom (PBL-FC) format, it is essential for them to watch the video lectures and partake in the on-line quizzes before coming to class. The PBL studio sessions are not spent covering theories, instead time is devoted to discussions and small-scale demonstration so that students have better perspectives on the engineering applications. Results from the two classes of students are collected and evaluated – one is subjected to a traditional PBL while the other undergoes a PBL-FC learning format. Key findings have indicated a marked increase in fundamental formative knowledge; enhanced problem-solving abilities; and production of better performing artefacts with regards to the set of design skills for students undergoing hybrid PBL-FC groups. Survey results further highlighted that PBL-FC students were highly positive towards achieving better project outcomes, enjoyed teamwork, and are able to think critically, as a result, became more active in their learning process.

Simon Cohen

Senior Researcher, IFSTTAR, France

&

Zoi Christoforou

Associate Researcher / Associate Professor, IFSTTAR / Ecole des Ponts
ParisTech, France

Travel Time Estimation by Bluetooth and FCD Technologies: A Comparison Study on Motorway

Advanced traveler information systems are being deployed at a large scale. Communications and display technologies now allow for the provision of key travel information to drivers in real time and, thus, introduce a new era in infrastructure management strategies. Real time information can be either prescriptive or descriptive and it may be provided either pre-trip or en-route. Information provision aims to assist drivers in decision making and to enhance travel safety and comfort with additional benefits to the overall system performance. Informed drivers can make more rational choices regarding route choice conditional upon travel time and travel time reliability.

Numerous studies provide evidence on the importance that drivers give to travel time (TT) information under normal traffic conditions as well as in the case of accidents, works, adverse weather, or special events.

In France, several infrastructure management systems using conventional inductive loop detectors are being renewed. New technologies are then progressively introduced such as Bluetooth sensors or Floating Car data (FCD). This modernization requires a good knowledge of the performance of these new sensors to display travel time on Variable Message Signs. This is why comparative studies are first conducted on these new devices.

This paper presents an in-depth comparison between travel time estimates (TT) from Bluetooth detectors (BT) and Floating Car Data (FCD). The test is performed, during summer 2018, on the A31 urban motorway in the region of Metz, North-East France. We first present the data sets and we precise the process used for travel time estimation by each technology. Next, we compare these estimates for variable length trips going from 5 to 40 km. Several indicators, such as the Mean Absolute Percent Error (MAPE), are used to illustrate the deviations between Bluetooth and FCD. Statistical analysis is carried out separately for passenger cars and heavy vehicles. Various settings are also considered in the comparison: peak hours, off-peak hours, working days, holidays, rain, etc. Furthermore, stable linear relationships between the two TT estimates are calibrated.

Finally, results are discussed and recommendations are provided to traffic operators to improve their knowledge of these new technologies for TT display on motorways.

Sergey Dubikovsky

Associate Professor, Purdue University, USA

Katherine Minarik

Graduate Student, Purdue University, USA

&

Peng Hao Wang

Assistant Professor, Purdue University, USA

A Correlation between Operational Status of Equipment and Technical Proficiencies of Aeronautical Engineering Technology Students: A Case Study

In order to graduate, students in the Aeronautical Engineering Technology (AET) program of Purdue University's School of Aviation and Transportation Technology are required to demonstrate knowledge of reciprocating engine overhaul. The same expertise is mandatory for qualifying for an optional Federal Aviation Administration's (FAA) 14 CFR Part 147 "Aviation Maintenance Technician Schools" graduation and Airframe and Powerplant certificates. In this case, students must take and pass written and practical tests based on the Federal Aviation Administration's guidelines. The preparation for this task consists of learning theoretical aspects of inspection, troubleshooting, repair, and overhaul. To reinforce those concepts, all students must perform practical inspection, disassembly, cleaning, inspection, and reassembly of the engine. However, some engines in the laboratory are functioning and some are not. This study examined possible correlations between an operational status of the equipment and students' technical proficiencies. The hypothesis was made that operational engine would lead to higher technical abilities of the students compare to use of the nonoperational equipment. This prediction is based on the difference in mental pressure levels to perform the tasks correctly. There is less pressure if the students are aware about nonfunctioning status of an engine, and more pressure if they know that the engine must run after the overhaul. The abilities were measured utilizing criteria of the Federal Aviation Administration's Aviation Mechanic Powerplant Practical Test Standards (FAA-S-8081-28A).

Arthur Firipis

PhD Student, Deakin University, Australia

Siva Chandrasekaran

Lecturer, Swinburne University of Technology, Australia

&

Matthew Joordens

Lecturer, Deakin University, Australia

Nurturing Creativity through Differentiation while using 1:1 Mobile Devices for Learning?

Differentiation is an important concept for educators, because it attempts to explain the relationship occurring between theory and application. The responsibility to manage this relationship is that of the curriculum designer. Stating the obvious alludes to the need to have a clear understanding about differentiation. With the acceptance of 1:1 mobile devices within the learning space, differentiating to facilitate its use effectively is an important discussion. This paper explores the theoretical and practical considerations when differentiating the curriculum to incorporate 1:1 mobile devices. Also, results from a recent research study are discussed to contextualise and understand learner perceptions when using BYOD (Bring your own device) within the learning space.

Grigorios Fountas

Lecturer, Edinburgh Napier University, UK

Sarvani Sonduru Pantangi

Graduate Research Assistant, University at Buffalo, The State University
of New York, USA

Kevin Hulme

Researcher, University at Buffalo, The State University of New York, USA
&

Panagiotis Ch. Anastasopoulos

Associate Professor, University at Buffalo, The State University of New
York, USA

**The Effect of Driver's Cognitive States on Observed and
Perceived Aggressive Driving Behavior: A Correlated
Grouped Random Parameters Approach**

Previous research has shown that the determinants of perceived and observed aggressive driving behavior may differ. However, the consideration of major sources of aggressive patterns may introduce additional variations in the effect of such determinants. This study aims to provide new insights into the variations of these two behavioral components arising from driver's fatigue, as well as internal and external distractions (such as, rushing to destination, listening to music and solving logical problems) during the driving task. To identify how the factors determining perceived and observed aggressive behavior may vary across groups of drivers associated with such sources of aggressive driving, survey and simulation data are statistically analyzed. Separate models of perceived and observed aggressive driving behavior are estimated for fatigued and non-fatigued, distracted and non-distracted drivers. To address various aspects of unobserved heterogeneity, associated with the unobserved variations that are commonly shared among the behavioral components and participants, as well as their unobserved interactions, the correlated grouped random parameters bivariate probit modeling framework is employed. The results of the empirical analysis showed that the effect of the socio-demographic and behavioral factors on perceived and aggressive driving behavior may vary across the aforementioned groups of drivers, in terms of magnitude and directional effect. In addition, the identification of correlation among the unobserved characteristics further illustrates the complexities of the driving decision mechanism, especially when fundamental sources of aggressive driving are evident.

Ilaria Geddes

Postdoctoral Researcher, University of Cyprus, Cyprus

Understanding the Mechanisms and Impact of Growth on the Urban Form and Functioning of Cities

In the great majority of cases cities have been steadily growing and becoming increasingly complex through urbanization. Waves of growth may have occurred at different times and the characteristics of growth may vary depending on the geographical location of the city and its socio-economic and demographic context. However, it remains that common features, invariants, processes and regularities are persistently found in cities and in their growth mechanisms. These must be understood and exploited in our attempt to sustain better living environments. A key problem in our ability to analyze and understand the complexity of the urban form is the long-standing isolation of analytical approaches which were developed in different countries and research environments. Even more difficult is to develop and agree on a system of analysis which is able to capture the universal mechanisms through which cities change and assess how such changes impact on the functioning of cities, providing the evidence base to manage, mitigate and exploit the impact of growth and urban transformation.

This paper presents a transdisciplinary approach to urban analysis, which enables the deployment of multiple methods under a common framework. The approach is taken from the field of philosophy and the concept of cities as assemblages; within this a combination of social research methods and urban analysis tools are integrated to provide a comprehensive methodology for diachronic analysis of city development, thus enabling the understanding and assessment of growth patterns. The approach was tested in the case study of Limassol, Cyprus: a diachronic analysis of the city was carried out using historical and archival research, interviews with stakeholders, space syntax analysis, block size and land use analysis, mapping of contemporary census data as well as illustrative case studies. The aim of the research was to identify the mechanisms of growth which led to Limassol's specific urban form and identity. This paper presents the key research findings and discusses the extent to which the processes identified can be generalisable, how the proposed approach performed in this specific case, how it can be applicable to other contexts, the research challenges, contributions and prospects.

Rebecca Heckmann

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&

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Development of an Emission Calculation Tool for Sustainable Route Planning

In the great majority of cases cities have been steadily growing and becoming increasingly complex. Growth may have occurred at different times and its characteristics may vary depending on the geographical location of the city and its socio-economic context. However, it remains that common features, growth mechanisms and regularities are persistently found. These must be understood and exploited in our attempt to sustain better living environments. A key problem in our ability to analyze the complexity of the urban form is the long-standing isolation of analytical approaches developed in different countries and research environments. Even harder is to devise and agree on a system of analysis able to capture the universal mechanisms through which cities change and assess how such changes impact on the functioning of cities, providing the evidence base to manage, mitigate and exploit the impact of growth and urban transformation.

This paper presents a transdisciplinary approach to urban analysis, which enables the deployment of multiple methods under a common framework. The approach is taken from the field of philosophy, specifically assemblage theory; within this, a combination of social research methods and urban analysis tools are integrated to provide a comprehensive methodology for diachronic analysis of city development, enabling the understanding and assessment of growth patterns. The approach was tested on Limassol, Cyprus: a diachronic analysis was carried out using historical research, interviews, space syntax, block size and land use analysis, mapping of contemporary census data, and illustrative case studies. The aim was to identify the mechanisms of growth which led to Limassol's specific urban form and identity. This paper presents the key research findings and discusses the extent to which the proposed approach enabled the identification of causal pathways of development and of how the growth processes led to specific morphological and functional characteristics of the city.

Gene Hou

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Cross-Departmental Collaboration for a Project Based Senior Class: Intelligent Machines

Intelligent Machine Systems, their developments and applications, have a profound impact on our current culture, daily life and the job market for future engineering graduates. They can be found in entertainment, medicine, communication, military, manufacturing, transportation, security, to name a few. An intelligent machine system such as a factory robot or a military drone is multidisciplinary in nature. Furthermore, the complexity of the intelligent machine system has been expanded in such a pace beyond what traditional engineering education can effectively support, as the latter is usually divided along the disciplinary lines. Such observation led the faculty from three different engineering departments to jointly develop a cross-departmental, senior elective course to address in an integrated matter the overall design and application of an intelligent machine. The course is called, Intelligent Machine Systems: Technologies and Applications, which is a three-credit hour course, cross-listed among three departments with emphasis on hands-on, team-oriented lab experience.

The objectives of this class are two folds: (1) address the overall design and application of an intelligent machine in an integrated and systematic matter, and (2) prepare students to work in a team with engineers from different majors. Most importantly, this new course is intended to serve as a platform for instructional innovation in teaching an interdisciplinary, emerging subject to cross-departmental students by cross-departmental faculty.

The class is made of three different projects with a mix of lectures and laboratories. Two students from different departments will form a team. Students will work as a team to assemble, construct and program a robot for pick and place and an autonomous vehicle for path tracking and mapping. Every lecture/lab module is designed gearing toward the related class project. Lecture/lab topics include sensors and actuators, hardware/software interface, communication protocols, microcontroller embedded systems, programming, machine design, computer vision, navigation, inverse kinematics and feedback control.

Since its onset in Fall 2013, the format and the technical content of this course have been undergone through several revisions to deal with the cost of consumable parts, balance of skill sets, the distribution of teaching load, TA training and the frequently updated software and hardware. The paper will address the challenges encountered and the resolutions put in

place during the development phases of this course and the outcomes of these efforts.

Bun Song Lee

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Characteristics of Cities Encouraging Bus Commuting, Subway Commuting, and Active Commuting (Biking and Walking to Workplaces) in the United States

In my coauthored paper published in *International Journal of Sustainable Transportation* (2016) "Bus commuting, subway commuting, and walking to workplaces in US cities: Socioeconomic factors of transit commuters," we investigated bus ridership data in small- and medium-sized US cities, which has been primarily ignored in the earlier literature. We also analyzed data on bus commuters, subway commuters, and walkers to workplaces in the eight largest cities with extensive subway systems and 22 other large cities. The analysis employed the 2010 US Census (IPUMS data). Generally, the characteristics of subway commuters are quite different from those of bus commuters. The characteristics of walkers in all the US cities are very similar to those who commute by bus.

In the proposed paper we will expand our previous study in two directions: First, we will pool different years' US Population census data including 1990, 2000 and 2010. By doing this we will investigate how commuting behaviors in US small and medium-sized cities have changed over the time.

Second, our new analysis will concentrate on identifying characteristics of U.S. cities which encourage usages of bus commuting, subway commuting, and active commuting (biking and walking to workplaces). These characteristics of U.S. metropolitan areas will include both socioeconomic characteristics and transportation related infrastructures in each city.

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&

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Developing Students' Critical Thinking, Problem Solving, and Analysis Skills in a Problem-based Organic Synthesis Course

Organic synthesis involves many modern organic reactions whose elusive charm will frustrate ordinary students if the course is taught in a classical format. Problem-based learning can not only enhance the engagement of each student in the classroom but also be helpful for students to digesting and absorbing knowledge. And according to Ausuel and Novak's theory of meaningful learning, the learner must possess prerequisite knowledge with which to anchor the new knowledge. Furthermore, the learner must consciously choose to relate the new knowledge to previous knowledge in some nontrivial way. With this in mind, at the first stage we presented students with their familiar structure and encouraged them to solve the synthetic problem. Although students discussed and tried every possible method they have learned but they soon discovered if focused on traditional reaction this synthetic problem couldn't be solved successfully, which stimulated students to think and analyze the limitations of traditional reactions. How to solve the problem? The strong desire for problem-solving was greatly evoked.

Then we introduced new modern reactions, explicated the characteristics, the mechanisms, the application scope of the modern reactions and made students familiar with this reaction.

At the third stage, the modern reaction was applied in the synthesis of the unresolved molecule and gained success, Which made students realize the distinction between traditional reactions and modern ones. Then we further apply this reaction into synthesis of new target molecules and deepen students' understanding of this reaction.

Herein, PBL not only develops skills such as group work, communication, but also the skills of critical thinking, problem solving, and analysis skills which are more valued than the reaction itself.

Claudio Meninno

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Architecture and Infrastructure: Strategies, Methods and Techniques of Integrated Design for Cross-Border Territorial Development in Europe

The research aims to analyze the relationships between architecture and infrastructure by identifying the methods and techniques for the enhancement of the cross-border area between Italy and Slovenia, and in particular the territory of Gorizia and Nova Gorica. In addition to the general principles for territorial action, it is required to identify concrete cases capable of triggering the dynamics of economic development among the neighboring states within the European Community.

The objectives can be summarized as follows:

Identification of a methodology for the analysis and design of infrastructural networks aimed at the creation and development of large cross-border infrastructures for the economic development of a given geographical area.

Definition of a model of infrastructural and economic relations between member states of the European Community such as to be used as a reference in transnational development processes (this aspect was welcomed with particular interest by the President of the European Parliament, who gave initiative the Patronage of the European Parliament).

Identification of the areas involved in the construction of the research infrastructure, analysis of the needs and territorial repercussions, identification of the urban and architectural works necessary for the proper functioning of the operation and possible developments obtainable on the urban area concerned.

Expected Results

Identification of the actions necessary for the economic-functional success of a cross-border infrastructure node placed in a favorable strategic position (integrated logistics-economic platform).

Analysis of good practices for the identification of areas suitable for the acceptance of similar integrated areas and for their correct development.

Definition of punctual interventions related to the realization of the project.

Definition of a Replicable Model on European Scale

The picture that emerges is the definition of an integrated economic-logistic platform capable of being characterized as a retroport for the port system of the Northern Adriatic Sea and which could also benefit from the recognition of the status of a Special Transfrontier Economic Zone. This is made even more concrete by the direct relationship with the European Adriatic-Baltic and Mediterranean connecting axes, by the benefits deriving from the presence of the Northern Adriatic Sea ports system and in particular from the Free Port of Trieste.

In this extremely positive framework, the project could represent a point of union between various infrastructural layers and at the same time constitute the "positive systemic shock" identified by the research as an element capable of initiating rapid innovation processes for the territory analyzed.

Similar experiences on comparable areas have generated economic benefits such as to trigger urban and territorial regeneration operations with significant effects on the urban structure of the neighboring cities. Furthermore, this condition makes it possible to hypothesise the creation of architectural opportunities to encourage the reuse of abandoned or underused industrial areas, barracks (particularly numerous in the analyzed area), state-owned buildings and brownfields inside urban areas.

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Exploring Place and Space as 'Fluid Centres' for Preparing Geography Student Teachers in Becoming Curriculum-Makers

Since the establishment of the national curriculum in South Africa the 'disjuncture' between university and school geography has become commonplace. The nature of change in geographical knowledge in the academy is therefore important in helping student teachers to understand and 'cope' with a rather 'fragmented' geography curriculum awaiting them in schools. One of the many challenges experienced by teacher educators is gaining a precise conceptual grasp of what geographical knowledge is and how it can best be mediated across the spatialized tension between the academy and school geography. Adding to the complexity of the knowledge agenda are the current pressing environmental and social issues. This poses several questions for teacher educators to reflect upon such as: *What is school geography really for? Secondly, what type of knowledge and skills are needed in the 21st century that would equip student teachers with an adequate intellectual toolkit to respond to these challenges in practice?*

In this paper I argue that some of the answers to the aforementioned questions can be found at the conceptual and pedagogical intersections of the notions of place and space, that is, at the 'fluid centre'. I shall address these questions by discussing how organising pedagogy around the 'fluid' centre could: provide a different lens for rethinking the purpose of geography education; illuminate an intellectual toolkit for student teachers to become curriculum-makers amidst a 'fragmented' school geography curriculum; and utilise student teachers' *sense of place* and *sense of planet* as key components in strengthening the relationship between university and school-based geographies.

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&

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Using the Smart Growth Principles for Real Estate Development around Rapid Transit Stations to Achieve Sustainability

Real estate development around rapid transit stations in Bangkok, Thailand, has been highly desirable for decades. A major drawback is that development depends on the individual idea of each real estate developer, without consideration for the quality improvement of the whole area around transit stations. Moreover, all developments are controlled by out-of-date regulations. Therefore, the land use around rapid transit stations does not promote economic, social, and environmental sustainability pillars. Recently, the Thai government introduced a policy which hopes to use the Transit Oriented Development (TOD.) concept as a crucial tool to make national rail development projects successful. Nonetheless, such projects have a high risk of being unsustainable as there is no TOD guidelines issued, and no requirement for the bidders to specify the economic activities and the size of the population around the stations following internationally accepted guidelines. This paper, thus, is to affirm that “using the Smart Growth principles for real estate development around rapid transit stations helps to achieve sustainability.”

The case study presented in this paper is an example of the real estate development around the rapid transit stations in the municipality of Rayong. This municipality is where the government plans to build one of its high speed train stations in an urgent plan to develop the Eastern Economic Corridor. The characteristics of Rayong Municipality are suitable for development utilising the Smart Growth principles. Data was collected through public hearings, spatial surveys, hands-on workshops, and questionnaires. Data analysis methods included content analysis along with percentage and mean statistics. The main content of this paper will show the process of using analysis results to create a master plan for real estate development projects around transit stations. Such a process starts by identifying the boundaries of the area to be developed, followed by reorganizing internal plot boundaries, then specifying how each plot of land is divided up to achieve cohesive mixed use. The density and height of buildings is then decided upon, followed by the calculation of building foot prints and whole building areas, and lastly the size of the population around the station is forecasted.

The creation of this master plan proved to the stakeholder that “using the Smart Growth principles for real estate development around rapid transit station areas to achieve sustainability” is acceptable for future implementation. Also, the master plan helped to forecast a population growing to 313,337 in 20 years. This is highly beneficial for investment plans for real estate and rail system development projects.

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Contribution to the Advancement of Cruises in the Eastern Mediterranean

Cruises liner each year achieve better results and becomes are very attractive. Demand for cruising has increased 68% in the last ten years. Intergenerational cruising is increasing in popularity as cruise amenities designed to satisfy every age from younger to seniors. The realized sea transport of 23 million passengers on cruises in 2015, with a tendency of further growth¹ increase in the number of passengers from year to year. From an economic point of view maritime transport of passengers in 2015, with a profit of \$ 38 billion is very significant even more so because each year a greater. Regional classification cruises are the most represented Caribbean with 33.7% followed by the Mediterranean with 18.7%. Proportion of passengers on cruises with other continents is over 60% which is very important if we want to increase the share of the Mediterranean Sea in cruises. Increasing the number of cruise is accompanied by the construction of large passenger ships² which leads certain areas in an awkward position because with such big ships is not possible to berth in small places which with history and sights could be also very interesting. Areas in the Mediterranean with a very indented coastline and numerous islands and cultural sites are focused on the cruise with smaller luxury cruise ships. Since the desire for luxury travel continues to grow on cruise ships this article will provide a brief overview of the cruise at the global level in order to demonstrate the possible development of cruises in the eastern Mediterranean with smaller luxury cruise ships.

¹ Expected increase in passenger numbers by 2018. to 24.2 million

² The largest passenger ship "Harmony of the Seas", 226 963 GT, a length of 362 m, a width of 47.5 meters, draft of 9.30 m, speed of 25.2 knots, 18 decks, 2,747 rooms, capacity 5,479 passengers and 2,300 crew.

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Public Space and Artefacts: Several Alterations of Historical Squares in the Czech Republic

Touristic mode, widely understood as accumulation of perceptions, is embedded in contemporary society. It has influenced not only functioning and reception of cities but also cities' agenda of making alteration of public space. The touristic mode is related to another overwhelming feature of our society namely aestheticisation. Indeed, aestheticisation often affects alteration of public space.

The paper looks at different examples of several alterations of historic squares in the Czech Republic where artefacts play a crucial role, paying attention to the relationship between artefacts, space and special delineation and their perception. The paper focuses on the relation between object and historic built environment and how it is influenced by touristic and aesthetic reception of the city and also by legacy of modernity. The latter is deeply rooted in the Czech modern architecture which had specific nationalistic and political context within the Czech history.

The role which artefacts play in modification of public space is often related to the touristic mode, to the legacy of modernity and to the phenomenon of aestheticisation. The mentioned approaches and tendencies which also shape alteration of public space will be critically discussed in regard to the preservation of historic environment.

The paper departs from the theoretical approaches of B. Groys, W. Benjamin and Z. Bauman, relating them to the concrete examples of alteration of public space of several historic squares in the Czech Republic.

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Intelligent Solutions Supporting the Development of Electromobility

Transport brings with it numerous problems, especially with regard to congestion in city centers and has a negative impact on the environment. Institutions that influence the shaping of transport systems are constantly looking for solutions that can change the choices of travelers, and thus the modal split of traffic towards pro-ecological solutions. Electromobility is a relatively new trend towards reducing the negative impact of transport on the environment. However, in many cases the development of electromobility is too slow. Among the solutions that can accelerate the increase in the number of electric vehicles in cities, you can indicate the use of modern information technologies. Among other things, this issue devoted to research carried out in the framework of the international project "Electric travelling - platform to support the implementation of electromobility in Smart Cities based on ICT applications" in the ERANET CoFund EMEurope financed among others from the means of the National Centre for Research and Development.

The term smart refers to the use of many solutions in the field of advanced technologies. The flow of information is one of the basic conditions for the functioning of such solutions. The use of intelligent technologies can accelerate the development of electromobility in cities. In accordance with the principles of sustainable development, it is the combination of rational use of energy and technological development that is the key to success in this field. The information transfer in modern and intelligent cities is a necessary element for their efficient and effective functioning. This flow should guarantee proper identification of the needs of travelers (in accordance with the definition of sustainable development), as well as support for travelers in deciding on the course and manner of travel. In the case of electric vehicles, a significant limitation is the range that a car can achieve on a single full battery charge. Smart solutions can support a traveler in several ways. First of all, they can break the barrier of traveling by electric car over longer distances, through support planning stopovers on charging. The dynamic search of optimal routes and booking of the charging station can minimize the inconvenience resulting from the limited range of the electric vehicle. Looking at the problem on the other hand, smart devices in vehicles and their communication with the infrastructure can extend the distance that

can be traveled on one charge, dynamically choosing routes to the current traffic flows distribution of the transport network.

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**Public Perceptions on Safety Benefits and Security Concerns
from the Future Use of Autonomous and Connected Vehicles**

Connected and autonomous vehicles (CAVs) are shortly anticipated to be deployed on highways across the world, including the US. Public perception of safety benefits and security concerns regarding CAVs are key factors in determining their widespread adoption. This paper aims to empirically explore individuals' perceptions towards safety benefits from the future use of autonomous vehicles, in terms of possible reduction in the number and injury-severity level of vehicle crashes. Concerns about equipment failure and associated crash occurrence, as well as concerns about security of CAVs against hackers/terrorists, and against issues related to personal information privacy are also investigated. To identify the factors that influence individuals' perceptions towards the safety benefits and security concerns, data obtained from an online survey are statistically analyzed. The survey includes responses from 692 individuals located in 19 countries worldwide. To address inherent heterogeneity patterns in the statistical analysis, correlated grouped random parameters bivariate probit framework is employed. The individuals' perceptions of safety benefits and security concerns is empirically found to be affected by a number of socio-demographic characteristics and stated opinions about various CAV usage scenarios. The empirical findings of this paper can provide new insights to automobile manufacturers and policy makers for the potential determinants of public acceptance of CAVs from their future use.

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The Potential and Limitations of Transport System as Factors Affecting the Development of Electromobility

The term electromobility means the possibility of moving users of the existing transport system, taking into account its potential and limitations, using alternative-fueled vehicles (vehicles powered by electricity). Electromobility does not only directed to means of transport, but also technical infrastructure allowing travelling with vehicles requiring the availability of charging stations in a specific spatial and appropriate technological solutions. It also includes public transport that uses the potential of newly created electrical solutions in addition to being environmentally friendly. Electromobility is struggling with legal and economic problems related to the creation, purchase and use of electric vehicles, as well as the implementation and use of charging infrastructure.

The development of electromobility in the economic, infrastructural and social aspect is the result of the implemented policy of sustainable development of transport, according to the White Paper, which includes conceptual proposals referring to specific areas within the EU. The key factors affecting the development of electromobility are the potential and limitations of the transport system as well as legal and economic aspects in the area of electromobility services. The specificity of a specific region, including the potential and limitations of the transport system, determine the possibilities of developing electromobility services. By identifying the weak points of the transport system and key transport solutions in the field of travelling persons and transport of goods, the aim is to use existing solutions and changes existing in direction to solutions favoring the use of electromobility, taking into account the need to minimize the negative impact on the natural environment.

The indication of elements of the transport infrastructure description as input to the planning algorithms of the charging station localization is one of the tasks carried out within the framework of the international project "Electric traveling - platform to support the implementation of electromobility in Smart Cities based on ICT applications" in the ERANET CoFund EMEurope program, financed among others from the means of the National Centre for Research and Development. The main objective of the project is to develop support tools for the development of electromobility services in urban and suburban areas, directly for users of the transport system, as well as local authorities managing this system.

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Urban Park Accessibility Evaluation Based on Gravity Model and Realistic Traffic Data: An Example of Baoding

Urban residents in the new era tend to live in a city that is more connected to nature and more diverse life. Urban park provides people with the possibility of leisure, sports and communication so that promoting its service level and accessibility is an important way to improve the quality of the city and the residents life.

In the accessibility study, the gravity model is a more reasonable research method. It takes into account the residents' demand for facilities, the service supply capacity of the facilities, and the transportation distance between residents and facilities. However, this method is rarely used to explore the accessibility of urban park. The study of humanity is even more lacking in point-to-point precision research. Besides, traditional analysis usually establishes a road network based on road grades, but the real situation is more complicated. We cannot simulate a real traffic system.

As a result, in this paper, the point-to-point gravity model and realistic traffic data are taken as the core technical method, which can improve the accuracy and objectivity of the analysis. The specific technical methods include:

1) Use the WeChat thermal data to establish the spatial distribution of the population into grid.

2) Use online Application Programming Interface (API) of the Amap to obtain the location of the urban park and the realistic point-to-point time from every population grid to the park under different modes of transportation.

3) Use the green area to estimate the service capacity of each park.

4) Taking Baoding, Hebei Province as an example, we conduct a case study. Finally, the paper comprehensively evaluates the service level and accessibility of the urban park, and make recommendations on its distribution.

The results show that the overall urban park accessibility of Baoding has a polarized distribution. We should achieve a balance between the population and the urban park service level. In the future construction of urban park system, areas with high service population, low service capacity and low accessibility should be paid close attention.

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Student-Teachers' Conception and Perception of the Use of the Inquiry-Based Approach in Geography Fieldwork in Singapore

The secondary and junior college geography syllabuses in Singapore recommend the inquiry-based approach for the teaching and learning of Geography. One salient feature of the syllabuses is the introduction of geographical investigation in fieldwork as a component in the examinations for both lower and upper secondary. Therefore, it is now necessary and essential for geography teachers to conduct geography fieldwork for students to enable them to actively make meaningful connections of what they learn in their classrooms with the realities in the field.

This present qualitatively study seeks to explore 36 student teachers' conception and perception of applying the inquiry-based approach in fieldwork within a 39-hour "Field-based Teaching in Geography" course at the National Institute of Education, Singapore. The key objective of the field-based teaching course is to enable student teachers to construct and deepen their understanding collaboratively of how to plan and conduct field-based lessons in Geography. It is an experiential course where student teachers will experience field inquiries themselves. Student teachers are required to complete three sets of reflections as part of their portfolio for assessment. The guiding questions for each reflection are:

1. What have I learnt about the nature and role of sparking curiosity in field inquiry? How might I spark curiosity in my students about a field inquiry topic?
2. What have I learnt about the data collection and data representation in field inquiry? What implications does this understanding have on designing field inquiry for my students?
3. What are my key understandings and takeaways about field inquiry from this course? How do these guide me when designing field inquiry for my students?

These reflection pieces from the 36 student teachers were analysed to surface themes and issues for further discussion. This paper will provide some insights from the student teachers' reflections so as to understand how they themselves construct their understanding of fieldwork and their conception of the inquiry-based approach in fieldwork.

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Engineering Education with Mixed Reality (MR)

Nowadays, virtual reality (VR) is widely used in different applications such as healthcare, fashion, sports, education, commercial and entertainment, etc. Education and training is one of the leading area which is expected to grow to US\$2.2 billion in revenue by 2023. For the education and training in various disciplines, VR gives an opportunity to connect with learners and teachers in a novel and meaningful way. VR enables experiential learning by simulating virtual environments. It not only increases students' levels of engagement. Hands-on VR learning approaches can also contribute to increase cognitive and memory abilities. It is suggested that games, simulations, and virtual worlds in VR were effective in improving learning outcome gains of the students in higher education.

Mixed Reality (MR) is the most reason reality teahnology which emcompassing both virtual reality (VR) and augmented reality (AR). MR further enhances the effects of VR technology in teaching and education. It not only allows digital model combined with real world, but also enable users to interact with the digital content dynamically in real time. MR allows interaction and feedback from the students which is particularly important for enhancing experience in teaching and learning. The benefits of incorporating MR technology into educational experiences include better engagement and the opportunity for students to experience and better remember what they have learned.

Despite various approaches have been developed to help students in understanding engineering subjects with the aids of VR, not much work has been conducted to investigate the effects of MR in teaching engineering subjects in tertiary education. Therefore in this project, an MR application is proposed and developed for the teaching and learning of Enigneering subject in tertiary education. The application is developed on the HoloLens system. A practicable application has been designed that allows students to visualize the geometry of 3D objects, as well as the exploded diagrams of selected components. The students can command the system through the command manual, or signal the system through gazing, gesturing and voice to implement instructions. We have organized two MR workshops for the teachers and students in the university to

collect their feedbacks and comments. The teachers and students are allowed to experience and develop their MR application in the workshops. It was found that the MR application can help students in understanding the learning outcome of the engineering subject in university, the workshops can also enhance the skills of teachers in teaching university subjects with the support of MR. The outcomes and recommendations for future work of the proposed MR application are discussed and explained.

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Transport Policy and Create a Western Balkans Market: How to Mirror the EU's Experience

The creation of a United Europe is in the final stage. For the complete mosaic image called European Union, the part of the Western Balkans still remains to be assembled. Last but not so simple step. Historically vulnerable, sensitive, mixed with many nationalities, similar but still different. Economically underdeveloped and vulnerable, socially unstable and politically aroused, the Western Balkans are still far from a stable European core. GDP per capita in the Western Balkans, adjusted for purchasing power parity, is half that of eastern European EU countries, one-third that of southern EU members and a mere quarter of the richest EU members in western Europe.

The question that imposes itself is: how to overcome those differences among Balkans countries, to complete the historical vision and final mosaic puzzle of European Union?

We should look for the solution historically for several decades back when creating the United Europe model. Prosperous and contemporizing Europe began its vision with the creation of a common market. And the market gives its benefits only with its physical ties i.e. transport and communication links. Transport links between the countries of the Western Balkans, with all accompanying economic, political and administrative adjustments, can contribute to realizing the single market as the final phase of a United Europe. All future hopes and views are focused on finalizing Pan-European transport corridors in the Western Balkan countries, through which the trade peaks will be strengthened, overcoming the decades-long problems and conflicts in this part of Europe, and to achieve the long-awaited model for a Common European Union. But we must be realistic enough to see that transport infrastructure is not some miraculous tool with which to solve a society's development problems. It is only one part of the story. Transport must work in union with national development programmes, physical planning, investment, economic and monetary policy, custom and legal regulations. But we must acknowledge that, in many respects, the quality and success of life of Balkan's citizens depends on the vitality and responsibility of implementation many structural changes. One of the crucial factors is still transport infrastructure.

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Assessment for Adequately Qualified Instructors in Maritime Education and Training Institutions

Introducing new technologies, knowledge, understanding and proficiency for seafarers is a challenging task for maritime instructors since it affects maritime safety. Effective teaching strategies depends on qualified instructors with STCW Convention requirements and adequate arrangement of teaching. According to STCW Convention every party shall ensure that all instructors of the Maritime Education and Training (MET) institutions are appropriately qualified for the particular type and levels of training. This article presents a review of factors that are not included in STCW Convention requirements and are very important for development of instructor's competences and the strategies for teaching and learning.

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Predicting Passenger Volume of the Regional Airport Mario de Almeida Franco to City-Pairs

In the air transport sector, to predict the volume between city-pairs of an airport is extremely important for its development. With the support of this matrix OD it is possible to analyze the main destinations and origins of an airport, favoring new routes creation, new agreements or withdraw of routes prioritizing the balance and financial development of the airport and its region. The air transport system transported 4 billion of passengers in the year of 2017. Developed countries have a higher average of annual trips per habitant than the triple of the Brazilian average, even it had been increasing. However, on the studied Uberaba airport the passenger's movement has decreased, reaching only 60000 passengers in 2017. The gravity model used to estimate the passenger volume has not been previously applied between city-pairs on Brazilian airports, neither on the studied airport. Based on such forecasts, airlines can make decisions regarding new routes or additional flights on existing routes. The purpose of this study is predict the volume between city-pairs, using the gravity model, in order to improve the current scenario and hence addition of new routes of the Uberaba Airport - Brazil. The study started from an analysis of the economic and social scenario of the region and city-pairs. The required data was collected by ANAC, IBGE, INFRAERO, HORUS and other Brazilian organism and by questionnaire with the Uberaba population. This study used the gravity model include variables describing the general economic activity, geographical characteristics, air service characteristics of city-pairs. This paper presents a gravity models that can be used for air passenger volume forecasting between Uberaba and city-pairs. The estimate from gravitational model shows that destination city more demanded from Uberaba had excluded in 2017/2018 causing a drastic decrease of its users on the short period. The estimate from gravitational model shows that destination city more demanded from Uberaba had excluded in 2017/2018 causing a drastic decrease of its users on the short period. Through these results, the airport operators can show this estimation to attracted air companies to operating on the area, so they may offer more flights to attend the local demand.

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Ecological Resilience Assessment and Optimization Suggestions of Yangtze Middle Reaches Megalopolis

Research on the assessment and regulatory control of region ecological resilience is of great significance for both urbanization quality improvement and sustainable development. This study selects Yangtze Middle Reaches Megalopolis which includes 4 urban agglomeration sub-regions such as Wuhan megalopolis, Xiang-Jing-Yi city belt, Changsha-Zhuzhou-Xiangtan megalopolis and city cluster surrounding Poyang Lake totaling 31 cities in China as objects. Using systematic analyses combined with a comprehensive index assessment method, this study constructs indices to examine the region's ecological resilient capacity for change and renewal. Regional ecological organization, function and maintenance are three major indices cause climate, vegetation coverage and urban eco-facilities are placed emphasis on the assessment. And each of them involves 2-4 specific parameters. In addition, the entropy value method is used to evaluate overall urban ecological resilience in the respective region. After collecting datum, the GIS and regression model are used to analyze. The result of the assessment reveals the spatial differentiation among cities and the distribution pattern of the ecological resilient capability in the Yangtze Middle Reaches Megalopolis. There appear to be a low level of ecological resilience capability in the megalopolis and fragmentation is remarkable. And the capability spatial distribution of the 4 urban agglomeration sub-regions of ecological resilience is classified as balanced pattern, severe fragmentation pattern and center-edge gradient pattern. Furthermore, city's population size is also verified to cause the low ecological resilience. Three Suggestions for optimization are put forward in the discussion part. They are overall promotion strategy, sub-regional control strategy and population control strategy.