

IDEA League Mobility Summer School Summer School in Aachen University: Safe and Sustainable Transport

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1. IDEA League Summer School Program

Information about the program

The overseas experience that I participated this September was through IDEA League Mobility Summer School. IDEA League is founded in 1999 and is a network of several European universities such as TUDelft, ETH Zurich, RWTH Aachen, and Chalmers University. This is a collaboration program which leads technology and science activities in education, research, and quality assurance. This has several summer school programs in summer held by 4 different universities. IDEA League also invites several Asian universities and students to participate their program. The title of summer school program which was held in Aachen University, Germany.

The detailed information is as the following:

- Title: Safe and Sustainable Transport: Future passenger and freight transportation challenges-solutions and trends
- Place: RWTH Aachen University, Germany
- Period: September 22, 2014 – September 26, 2014
- Students:

The reason for applying the summer school program

What is extraordinary about Tokyo Institute of Technology is its unique multicultural scientific exchange between many outstanding universities in the world. Especially, when studying in Department of International Development Engineering, more opportunities are given to students who fulfill eligibility of any programs. Through IDEA League 2014, I may have an opportunity to take advantage of scientific exchange over a variety of students from different backgrounds. The other reason is to be motivated through enthusiastic discussions and debates by young scientists in the same field. I am certain that this future experience will definitely stimulate my research motivation and future plan as a researcher. These are the reasons why I would like to apply for IDEA League program 2014 in order to achieve one step forward as a young enthusiastic motivated scientist.

2. Introduction of RWTH Aachen University

Visiting Aachen, Germany



Aachen is a small city located in western Germany which has about 240,086 residents. Surprisingly, the number of RWTH Aachen University students is over 40,000 in the year of 2013, which is about one sixth of the total population. It usually takes two or three hours from Frankfurt by train and one and a half hour from Dusseldorf by train. I took a direct flight from Narita airport to Dusseldorf airport and then took train to Aachen University this time.

Aachen has a famous bread-like cookie called Printen. The taste is similar to ginger

bread and originally it was sold by pharmacists since several ingredients inside were considered to be beneficial to health. The other famous thing about Aachen is Aachen Cathedral located in center of the city. It was one of the first 12 items to be included in entry list of UNESCO world heritage sites in 1978. I had a chance to visit the place and taste Printen during my short stay in RWTH Aachen University.



Pic. 1. Famous Printen in Aachen



Pic. 2. Aachen Cathedral

RWTH Aachen University

RWTH Aachen University was established as Polytechnicum in 1870. It is one of Germany's Universities of Excellence with strong emphasis on technological research. About 20% of total students are international students and their number exceeds more than 6,500. The remarkable research is highly emphasized on electrical, mechanical engineering, computer sciences, physics, and chemistry and so on.



Pic. 3. RWTH Aachen University Main Building (left) and Super C (student center, right)

3. Program Outline

The schedule of summer school program is listed in Table. 1. The program consists of 5 days program with theoretical and applied lectures, visit of IAA Commercial Vehicles held in Hannover, guest lectures by industrial experts, and deepening group work.

Table. 1. 2014 Mobility Summer School Program for RWTH Aachen University

Day 1: Welcome at RWTH Aachen	Day 2: Safe and Sustainable Transport and City Tour	Day 3: Safe and Sustainable Transport and Group Work	Day 4: Study trip to IAA Commercial Vehicles	Day 5: Competition and award ceremony
	09:00-9:30: Organizational issues and timeline	09:00-10:00: Customer- oriented vehicle design Nils Neumann, Institut für Kraftfahrzeuge, RWTH	06:00-10:00: Bus transfer to Hannover	09:00-12:00: Competition (Presentation of Group work result)
	9:30-10:30: V2X for Road Safety and Efficiency Christian Röss, Ford	10:00-11:00: Future technologies of commercial trailers Stefan Deutsche, Schmitz Cargobull	10:00-16:00: IAA Commercial Vehicles (guided tours: SchmitzCargobull , MAN, Scania, DAF)	12:00-13:00: Award ceremony and end of summer school
	10:30-12:00: Future Mobility, ADAS and	11:00-12:00: Introduction to group work		13:00-14:00: Lunch

	Sustainability Dr. Wolfgang Bernhart, Roland Berger Consulting	Alexander Busse, Institut für Kraftfahrzeuge, RWTH	
	12:00-13:00: Lunch	12:00-13:00: Lunch	
13:00-14:00: Arrival and registration of participants	13:00-15:00: Future Mobility Perspectives Richard Jaimes, Continental		
14:00-15:30: Welcome at RWTH Aachen Dr. Bidian (Secretary general of IDEA League) Prof. Schmachtenberg (rector RWTH Aachen University) Dr. Urban (vice director ika, RWTH)	15:00-17:00: Future Technologies of Commercial Vehicles Dr. Markus Baum, Daimler Commercial Vehicles	13:00-18:00: Group Work	
16:00-18:00: Introduction of participants	17:00-18:30: Guided City Tour of Aachen		16:00-20:00: Bus transfer to Aachen
18:00-19:00: Free time and check-in	18:30 -: Dinner	18:00-: Dinner	
19:00 - : Dinner			20:00-: Dinner

4. Experiences in 2014 RWTH Aachen University Summer School Program

Theoretical and applied lectures

We received 6 lectures within 5 days and were asked to present group work at the end of the program utilizing knowledge and insights we gained through lectures. The six lectures are the following:

1. *V2X for Road Safety and Efficiency:*

Vehicle to vehicle communication in Intelligent Transport System to secure safety of drivers and society

2. *Future Mobility, ADAS and Sustainability:*

Connected cars and automated cars – implications for the industry

The trend in megacities, developing countries

3. *Future Mobility Perspectives:*

Methods for future research – forecast, trend, scenario

Need to think and understand complex connections in society

4. *Future Technologies of Commercial Vehicles:*

Active safety technologies

5. *Customer-oriented vehicle design:*

Customer analysis and holistic market approach

Understanding correlation of socio-economic change, mobility behavior of customer groups

6. *Future technologies of commercial trailers:*

Fuel consumption reduction by aerodynamics study and weight reduction

2014 IAA Commercial Vehicles Show

IAA Commercial Vehicles Show is the leading International trade fair for business, automotive, transportation, logistics, automobiles, automotive parts, automotive services, service station supply, etc. New technologies are introduced at the place. Some of the keywords are: light weight design, new chasis design, and research on aerodynamics, low fuel consumption, etc.



Pic. 4. and Pic. 5. Visit to IAA Commercial Vehicles show

Group work presentation and competition

On the third day of summer school, the students were asked to be divided into three groups and present their analysis on the last day of the summer school. The topic of group work was configuration of vehicle powertrains best fitting to demands of specific customer group and scenario of an IDEA League Region 5 years from today. We were given some data about customer targets, different scenarios, information about technologies to reduce CO₂ emissions, etc. and utilize these data to set our parameters and reasons to choose one particular vehicle configuration for each targeted customer group. The work was closely related to marketing and automotive engineering. We had 4 different nationalities in one group: India, China, Germany and Korea and 3 different majors in one group: mechanical engineering, transport planning, and automotive engineering. Successful key factors for winning 2nd place in competition are active discussion,

dividing the tasks while utilizing individual's strengths, high efficiency.



Pic. 6. Group Photo and Pic. 7. Presentation slide from competition day

5. Conclusion

It was actually 3rd valuable abroad experience while studying in Hanaoka Lab, Department of International Development Engineering. The three are the following: British Science Museum Internship, London, Great Britain, 2012, AOTULE International Student Conference, Bangkok, Thailand, 2013, IDEA League Summer School Program, Aachen, Germany, 2014. There are a lot of intelligent young researchers outside and it is always good idea to get stimulation by interacting with people from different disciplines and backgrounds. Although group work seemed to be challenging and complex at first but our team struggled together in order to produce meaningful output. I really am grateful again to have such a valuable opportunity via internship and summer school program here in Titech.