IGERT Europe Summer 2014 Trip Report

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OVERVIEW & GOALS

My dissertation research is focused on infrastructure planning for new mobility concepts, with a focus on charging infrastructure for electric vehicles (both in driver-operated and autonomous settings). This is a field that has piqued a lot of research interest in the last couple of years, and the greatest challenge to researchers is often finding the right forum to share their research findings and interests. As an interdisciplinary topic that interests many decision makers (including transportation planners, utilities, automotive manufacturers, insurance, safety regulators, and academics alike), this research is difficult to generalize across geographic regions due to the nature of transportation infrastructure, energy regulations, and driver/user preferences. Funding from IGERT allowed me to spend five weeks in France and Germany this summer to enrich my perspective on this area of research, by attending conferences and meetings with researchers in similar and related fields of work. Furthermore, the five week experience abroad was deeply enriching personally. While I had traveled abroad previously, I have never lived in a foreign country for a somewhat extended period of time having to truly learn the ins and outs of managing daily life with my family abroad.

This trip report follows my summer European adventures chronologically. Each subsection of this trip report will highlight the academic conferences, research meetings, and other networking opportunities at specific destinations, followed by some travel experiences while in France and Germany.

TOULOUSE, FRANCE

For the first portion of the summer, I spent two weeks in Toulouse, France to attend the International Transportation Economics Association’s (ITEA) annual conference.
The first three days of the conference (June 2-4) featured a summer school which consisted of ten lectures and tutorials delivered by top transportation economics faculty from all around the world. The program can best be described as a condensed and intense short course on transportation economics, covering topics such as transportation investment and funding, congestion pricing, time and risk, agglomeration effects, aviation, competition, and privatization. This summer school came at a very opportune time as I was wrapping up the final draft of a chapter on transportation economics in the forthcoming text *Handbook of Transportation* (Routledge). I had emailed Dr. Robin Lindsey from University of British Columbia to seek input on the nuances of some key concepts. Attending the ITEA summer school allowed me to meet with Dr. Lindsey in person (as he was one of the instructors) and discuss the book chapter. Following the summer school was a two day conference in conjunction with the Toulouse School of Economics’ TIGER Forum, during which I presented research on the residential location patterns of electric vehicle owners during a lectern session. One of the highlights of the conference was the gala dinner, which was hosted at the Musée des Augustins, the second oldest finest arts museum in France (after the Louvre), as pictured below.

The week following the ITEA conference, there was a bit of free time to travel around the region. We visited the Japanese Gardens in Toulouse, took a cooking lesson in French pastry
and learned how to make macarons, visited the modern art museum, and toured the Airbus Toulouse facility.

We took advantage of the two weekends to take day trips to Albi and Carcassonne, both UNESCO World Heritage sites within easy train ride from Toulouse.
MUNICH, GERMANY

After two weeks in southern France, I based the rest of the three weeks from Munich. We arrived in Munich on June 15, and the next morning I was off to Burghausen for a three day conference with the Technical University of Munich (TUM)’s International Graduate School of Science and Engineering (IGSSE). The annual IGSSE Forum, headed by Dr. Ernst Rank, serves as a venue for students in interdisciplinary research to present their research as well as collaborate in workshops. I participated in the sustainable building design workshop led by UT School of Architecture professor Dr. Petra Leidl. At IGSSE, I also presented a poster on electric vehicle infrastructure planning.
One of the highlights of the IGSSE Forum was the conference dinner hosted at Raitenhaslach, a former monastery being restored by TUM as an event venue.

The IGSSE Forum also provided a great opportunity for all the UT IGERT trainees to spend time together. These three days also allowed us to coordinate schedules for activities for the rest of our stays in Munich.
Back in Munich, I met with one research group from the Munich University of the Federal Armed Forces (UniBw) and two research groups from TUM. Dr. Klaus Bogenberger at UniBw is a former engineering manager at BMW who has managed to obtain all of the data in BMW’s shared car operation, DriveNow, in Germany. I met with his research group for an all day workshop exchanging ideas on the current research and future direction of research in shared vehicle operations. One of Dr. Bogenberger’s Ph.D. students, Simone Weikl, is an expert in vehicle reallocation algorithms and I was able to gain quite a lot of insight to the recommendations she made to BMW for more efficient vehicle reallocation. BMW’s DriveNow program became profitable for the first time in the first quarter of 2014, partly due to implementing Simone’s strategies. I also presented research from my research group at UT on shared vehicles in an all-electric and autonomous setting, something that the researchers at UniBw have not yet considered in their simulations.

At the TUM-Garching campus, I met with Philip Wacker and Benedikt Jager (both Ph.D. students) from the Science Center for Electromobility. Philip gave me an excellent tour of their institute, including a peek at the low cost electric vehicle that the research group designed and prototyped themselves with an all-electric range of 120 kilometers. After lunch, Benedikt, who is working on a simulation of all electric taxis in Munich, offered some insights to his approach to modeling optimal charging station locations.
Back at the TUM main campus in central Munich, I met with Rafaella Riemann, who works with Dr. Fritz Busch in the Transportation Technology department. Rafaella is currently a member of the TUM Create team, living in Singapore and collaborating with researchers from the National University of Singapore on designing an algorithm for the spatial planning of electric vehicle charging stations. It was interesting to look at electric vehicle infrastructure planning in a setting where the all-electric range is not the key concern as Singapore’s geographic size is so small.

On the day before I departed for Europe, I attended TUM’s Munich School of Engineering (MSE) Colloquium. The conference consisted of mostly student-driven research, but also included a great key note speech from the head of hydrogen fuel cell research group at BMW. It was interesting to see BMW’s perspective on the complementary rather than competing roles of electric and fuel cell vehicles in the future of private transportation.

Due to the inconsistent weather while in Munich, I was not able to pursue as much sightseeing as I had hoped. However, one of the TUM Ph.D. students we met at the IGSSE forum offered to take us on a day hike in the Alps, and it turned out to be one of the highlights of this trip. The hike saw many different types of mountain scenery, from heavily forested mountains to a rocky canyon.
Other highlights in Munich included the excellent Deutches Museum (science museum), the biergarten summer culture, Nymphenburg Palace, and the BMW Museum and plant tour.

CONCLUSIONS

The five weeks I spent in Europe this summer provided such enriching experiences both professionally and personally. Meeting with researchers with similar and compatible research interests really helped me shape the framework for my dissertation. There were aspects that I had not considered before (such as the life of a battery due to charge/discharge cycles) that I will now be incorporating in my simulation. Furthermore, seeing the importance that European universities place on international studies has really challenged me to think about interdisciplinary research on a broader level. If my plans for an academic career come to fruition, I will definitely be involved in implementing ways for my graduate students to collaborate with researchers from other universities, particularly international universities.

The experience was also key in allowing me to get to know my fellow IGERT trainees better. Back in Austin, we all have busy schedules and personal lives that get in the way of truly networking outside the weekly meetings and field trips. In Munich, we were bonded by our common background and spent so much time together experiencing a new culture, new food, and new research.

Lastly, I treasure what this opportunity meant for my family in terms of being able to live like a local abroad. Learning how to manage simple household tasks such as grocery shopping with a baby with no car (and not on a Sunday, because German grocery stores are closed on Sundays) was an adventure all on its own. We enjoyed sightseeing at a slower pace and just taking in what it meant to live like a European for five weeks.