DAAD Rise Professional Summer Internship Program 2017
@Siemens AG, Munich

Rahul B. Warrier
(Email: jaguar243@gmail.com, Ph: +1(206)-489-8640)

Introduction

This is a brief account of my experiences during the Summer internship program organized jointly by DAAD (German Academic Exchange Service) and Siemens AG, Munich. When I applied for the position, I was a 4th year PhD student in the University of Washington, Seattle. I had been actively looking for internship positions in industry for a couple of months, when I received an email flyer from the university about the scholarship program. I immediately started preparing for the application, which turned out to be simple and straightforward. The selection process consisted mainly of applying for a range of projects offered by a host of companies in Germany. Siemens was my first and only choice since the project they were offering was closest to what I had in mind while I had been looking for internship opportunities. The application packet was mainly a resume and a reference letter from my advisor. Within a few short weeks I was forwarded to Siemens for an interview over Skype with an engineering supervisor after which I received the offer letter. That was the beginning of a fruitful three months spent in Munich that truly helped me grow in all aspects of my personal and professional life.

Munich

I was assigned to the Mechatronic Systems group in the Corporate Technology division of Siemens, located at the main campus in Neuperlach Süd, Munich. This was my first ever time in Germany, and in fact Europe, so I was a little nervous about how it would be working in an environment in which I did not know the official language. But, my fears melted away once I met my new colleagues and the whole team. Most people could understand and speak English but mainly it was the warmth and welcoming attitude that helped me get comfortable and focus on my work. Overall, I loved the work atmosphere and the campus in general.
Initially, I had some difficulty finding a place to stay, but that was mostly because I hadn’t planned in advance. This was mostly due to my Visa application taking longer than usual, so what I learned is to apply at least three months in advance of your trip. Once in Germany, you will need to get quite a bit of paperwork done with regards to social security, tax, residence registration etc., but the HR at Siemens and my other Intern friends helped me get it done. But, be prepared to spend some time at the government offices at least for the first couple of weeks.

Munich is a great place to live and work. I really liked the work-life balance that people were able to achieve. It was amazing how you could find people out by the lakes and rivers drinking beer and having a barbecue on a Tuesday evening, or rather any day of the week. I quickly got used to the relaxed atmosphere and I sorely miss it now that I’m back in my research lab. The English garden was probably where I spent most of my evenings, which included hanging out with friends and watching surfers try their skills.

The weekends also gave me a lot of opportunities to travel around Bavaria, especially to go hiking in the Pre-Alps, south of Munich.

Work

Working at a German company gives you a lesson on professionalism. I really loved the work ethic and drive that all my colleagues displayed which was really hard not to absorb. The work assigned to interns were also engaging and relevant with constant mentorship and review. I was given a lot of freedom in choosing my specific projects and goals and had great support from all the team members.

My project was mainly concerned with setting up interfaces to enable control of a robotic system that was being custom-built in the lab. This involved both hardware interfacing, e.g., using the CAN protocol to control the wheel motors, and mechanical and electrical assembly; and software tools, e.g., ROS for controlling the robot and Unity3D for simulations (including virtual reality). In brief, the following is an account of my activities during the whole internship period:

1. Implemented a ROS (Robot Operating System) node for communication with the wheel motors of the robot platform using the CAN protocol (using the ros_canopen package), and created teleoperation capability using keyboard/joystick.
2. Developed the URDFs and associated ROS infrastructure to control the v1 and v2 robots, both in real-time and simulation (using Gazebo).
3. Created a teleoperation node for the Shadow hand that allows for direct mapping between human hand motions and the Shadow hands using the Leap motion sensor. This was done using Leap motion assets on Unity and communication to ROS through the rosbridge-suite package.
4. Standardized the ROS# open-source project making it usable as a general tool for two-way communication between ROS (usually run on Linux) and Unity (usually run on Windows), which allows Unity to work as a RViz client (by adding an automated joint mapping routine based on the supplied URDF). This allows for VR simulation of the actual robot state in Unity, which has been implemented as an example using the v2 robot.
5. Made the ROS# repository ready for open-source deployment. Documentation for all the projects is available in the respective gitlab repositories.

I really enjoyed the work and I'm already using a lot of the tools and techniques that I picked up during the internship in my research.

Final thoughts

Apart from work and meeting new and interesting people, this program was also a great opportunity to travel around Europe. The scholars meeting at Heidelberg that was organized by DAAD was a wonderful opportunity to meet like-minded people from different backgrounds, all set in a picturesque town with a bustling nightlife. Overall, this Summer has been an unforgettable experience and has convinced me that Germany, and especially Munich, is a great place to live and work --- I'm pretty sure I will find a way to return!

I agree that my report and accompanying pictures may be used by the DAAD in printed materials, presentations, and on websites in order to inform funding organizations, sponsors, and students about the RISE program.