

Bio

Name: Aaron Silva

Major: Biomedical Engineering

Hometown University: The University of Iowa

German University: The University of Freiburg – Institute for Microsystems Engineering (IMTEK)

Project Title: Characterization of Stability Impact Factors of next gen Thin-Film Electrodes for Neural Implants

Freiburg, Germany Recap

When people asked me what I did this summer, I get to proudly answer that I spent my whole summer in Freiburg, Germany (first picture) working in Dr. Thomas Stieglitz's research laboratory at the Institute for Microsystems Engineering (IMTEK) at the University of Freiburg. This internship was everything that I could have hoped for. I was able to practice my German, gain research experience, meet an incredible amount of great people, travel around Europe, and grow as an individual. Even three months after the end of my internship, I still can't believe that I have had the opportunity for such an incredible experience.

I was able to spend my summer in Germany thanks to the Deutscher Akademischer Austauschdienst (DAAD) Research Internships in Science and Engineering (RISE) program. During the application in November, I had the opportunity to pick projects in multiple science fields. I applied for three different engineering projects at three different German universities. I was selected to work at IMTEK (second picture) with my project pertaining to studying the stability impact factors of electrodes for neural implants and the pulse testing of pH electrodes. In this program, I would get a monthly stipend to work on this project so that I could pay for my plane ticket and housing that I arranged by myself. I was also able to pick the dates of my internship, so I left for Germany on May 15th and returned on August 3rd. The DAAD RISE program allowed an incredible amount of flexibility which allowed me to plan my summer perfectly.

Finding living arrangements was the most difficult part of the process before arriving in Germany. DAAD gave us two websites that served as a starting point to try to find living arrangements. I used WG-Gesucht for the initial part of my search. WG-Gesucht was frustrating because after narrowing down the options by location, time frame, and price, the renter of the apartment would never reply to you. Alongside WG-Gesucht, the University of Freiburg had an apartment listing available that I tried because the university didn't allow students who aren't enrolled in courses to live in their dormitories. After once again not getting any replies from people, I decided to look for an Airbnb. I found an Airbnb for the whole summer that was a little expensive but after all the searching I was ready to get housing out of the way. Two days afterward, my mentor told me that she found an apartment for me. My biggest recommendations for finding housing is be patient and have your mentor help you because I know people that found their apartment a week before getting to Germany.

Luckily for me, I had a German passport. I didn't have to worry about a VISA, but I know that many other DAAD RISE students didn't get one because they were staying for less than 90 days. Furthermore, I didn't have to worry about a bank account because my grandfather lives in Germany, so

he set one up for me under his name. I do know that many other students got an N26 account because of how easy it was. Another very important thing was having phone service or data. What I did was go to Aldi and bought a SIM card and prepaid phone cards for my iPhone. It was 13 Euros for the SIM card and then 10 Euros for the phone cards, so it was a great option for such a short trip. Another thing to note is that in most Germany cities you must register with the city. In Freiburg, I only needed to register if I was staying more than 90 days. If you do go, make sure you bring someone that speaks German because the people there don't usually speak English.

Living in a new country came with many surprises, but by the second week, I already developed a pattern for my day. A workday included getting up to run in the Black Forest, having breakfast, biking to work, working, biking to the grocery store before heading home, making dinner, and watching World Cup games. My favorite part about my daily routine was that I was able to bike to work. I managed to find a bike by going to a Facebook group and asking if anyone had a bike that they would let me borrow for the summer. Another enjoyable daily routine is that I would stop every day at the grocery store to get fresh bread for the next morning and any necessary groceries.

My typical day in the lab included one of three things. The first possibility was pulsing electrodes with different waveforms and determining how that was affecting the electrodes viability. The second possibility was using pH electrodes to measure the change in pH of a phosphate buffered saline (PBS) solution that resulted from pulsing the electrodes with different waveforms. The last possibility was writing MATLAB scripts to analyze the results of the two previous experiments. I shared part of my project with an undergraduate from there. Being able to work with another student who has had a completely different education was a very good learning experience.

During the weekends, I was able to travel around Europe. I traveled to Furtwangen, Bacharach (third picture), and Heidelberg (fourth picture) in Germany, Prague in the Check Republic (fifth picture), Zurich and Interlaken (sixth picture) in Switzerland. The best trips were Prague and Heidelberg for the reason being that I visited Prague with 7 other DAAD RISE students who were working at other Germany universities and coming from Canada, the United States, and England. As well, I visited Heidelberg because we had the DAAD RISE Conference there. In Heidelberg, all the students who were in this program stayed there to meet each other. Meeting people who were also so passionate about research was exciting.

From all the experiences that I have had this summer, I highly recommend that you take advantage of such an opportunity. No matter what uncertainties or fears you have, there will be people that will help you make the experience a positive one. I think the best friend that I made who had a similar experience said it best, "You will have no idea how this has changed you. You will not notice at first, but all your friends and family will notice." Take a chance and be part of such an experience because you never know what type of growth you will have.

"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."

Pictures



1) Freiburg



2) IMTEK Building



3) Bacharach



4) Heidelberg



5) Prague



6) Interlaken