

## Personal Testimonial

<b>Research Stay</b>	
Institute: EPIC	
Project: Data analysis and tool development for a cybersecurity testbed (CESAR)	
Supervisor: Dr. Robert Cox	Duration of stay: 6months

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**MINTernship Program 2024**

**Date: 10.10.2024**



I spent the summer semester of 2024 at the University of North Carolina in Charlotte (UNCC), working at the EPIC (Energy Production and Infrastructure Center) institute. During this time, I was involved in a project in collaboration with the Department of Energy, gaining valuable insights into publicly funded academic research. This experience helped me grow both professionally and personally. In addition to my work, a significant part of my stay involved

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traveling and meeting new people. The application process was straightforward, and no expensive English certificate was required. I received a confirmation email in the last week of January, and a total of five students from KIT participated in the program.

### **Application**

The application process for the MINTernship was relatively straightforward. It required a formal application along with an online language test, which could be easily completed from a personal computer. After receiving acceptance, things moved quickly. We established contact with UNCC and applied for on-campus housing, which was mostly a formality since the rooms were already reserved for us. For the visa, after completing some online questionnaires with amusing questions and making various payments, I needed to visit the U.S. consulate in Frankfurt in person. If you bring all the necessary documents, the process is smooth. The visa is sent by mail within 14 days after the consulate appointment, so timing can be tight. It's also advisable to book flights and travel insurance early, as prices can fluctuate. We found it much cheaper to book a round-trip ticket, as a one-way flight was almost twice as expensive. The €1500 travel allowance covered almost all my expenses for the flight, visa (including the trip to Frankfurt), and international health insurance for seven months. For all participants in the MINTernship program, spots in the guest residence (Maple Hall) are reserved for the first four months, while students have to arrange their accommodation for the last two months. Due to internal decisions by the host university, Maple Hall will no longer host international exchange students.

### **Accommodation**

We were fortunate to stay in Maple Hall, which is centrally located in the heart of the campus and primarily intended for international students. It's about a 2-3 minute walk to the Student Union and the UNCC fitness center. The location is truly phenomenal. However, at \$850 per month, it's not exactly cheap, and you need to arrange payment early on. Since there were five of us participants this year, we had to split up regarding the apartments. This worked out very well because we had two apartments right next to each other, allowing us to spend a lot of time together. The four-person shared apartments (segregated by gender) in Maple Hall are somewhat furnished, with all essentials (towels, bed linens) provided. I was also pleased with the equipped kitchen. We had a Brazilian exchange student living with us for three months. It was mentioned before the program that Maple Hall would only be available until the end of July, and we had to sort out our stay for the last two months. I stayed in off-campus housing named "University Terrace" next to the campus.

### **Work Experience**

I was part of the project titled (project was renamed) "Center for Energy Security and Reliability (CESAR)," which focuses on analyzing the effects of cyberattacks on large-scale smart grids. Three supervisors and three international PhD students were involved in the project team. The project was just starting and was estimated to last three years. My main task was co-simulation of the smart electricity grid and building the test bench for the project. We had weekly team meetings and monthly project meetings with colleagues from the computer science department and project management. Initially, the project started slowly, with the first month spent on bureaucratic activities of the U.S. government and university. I began by reading the project plan, preparing for multiple brainstorming meetings, and getting the required tools and software

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installed. By May, we started gaining momentum. Our team validated various simulation tools and learned about them in a short amount of time. I also had the opportunity to work with a computer science PhD student to integrate the electricity grid model with virtual smart home devices. At the end of my internship, we presented our work to members of the Department of Energy and other industry leaders in a two-day workshop. Throughout my internship, Dr. Cox, Dr. Ehab, and Dr. Miao continuously guided me through various challenges and taught me many new things.

All KIT students were placed in the same office, which was directly next to Dr. Ben and the exchange program coordinator Jamie's office. Occasionally, some student assistants worked there, which often led to discussions about the optimal room temperature. Public buildings in the U.S. are heavily air-conditioned, so despite temperatures over 30°C outside, most of us wore long pants and wool jackets in the office. I moved to a different office that was less cold, but I still had to wear a pullover sometimes.

### **Things to Do in Charlotte**

Charlotte is huge and has a lot to offer. The typical clubs are located in the city center, called "Uptown," while bars and shops are spread across neighbourhoods like South End, Plaza Midwood, and NoDa, where you'll find many trendy bars and breweries. Through the German Club (a student group for people interested in the German language and culture), we met some nice American students our age who often hung out with us on weekends. We also enjoyed Wednesday night line dancing at Coyote Joe's and participated in kayaking at the White Water Center, which EPIC hosted for us. Since the semester ends in late April and doesn't start again until September, many younger students spend the summer with their families. While student group meetings don't happen during this time, some students stay in Charlotte for jobs or summer school programs. EPIC also covered the cost of participating in campus sports programs. With a swimming pool, fitness studio, and plenty of group activities, there's something for everyone—even for those who aren't sporty. Although the program is slightly reduced over the summer compared to the semester, there are still plenty of opportunities to balance out the time spent sitting at a computer. We also met up with Kelvin (a mutual friend from previous exchange students) who showed us around and planned some trips in the beginning. I often tried to participate in Tuesday night bike rides with Pam.

### **Transportation**

Transportation on campus is excellent, with several buses running across six lines during the lecture period, covering the entire campus. This means you can reach any point on campus within minutes. However, during the summer break, the bus frequency is slightly reduced, though this is not a big issue. If you have time, walking or biking around campus can be enjoyable, as it allows you to appreciate how beautiful and well-maintained the entire campus is. The campus is full of typical American lawns and well-maintained plants. It's truly a stunning campus.

Outside the university, cars are the main mode of transport. While there is a light rail system with two stops at the university, it's the only connection in all of Charlotte. The light rail starts at the university and runs across the city. We obtained a North Carolina driver's license, which in the U.S. also serves as a form of ID. Three of us arranged/bought a car. Sometimes they dropped me off around the city, which was really sweet of them. Otherwise, I used Uber. Unlike cities like New York or Philadelphia, it's uncommon to get by without a car in Charlotte. This becomes clear quickly, as nearly all students own cars, and it feels like half the buildings on campus are parking garages.

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Although Charlotte has more than twice the population of Karlsruhe, it feels more suburban, with everything very spread out. More interesting are the neighbourhoods of NoDa and Plaza Midwood. NoDa is easily accessible by light rail, which was built just a few years ago, with the campus as the end station. Plaza Midwood, on the other hand, is about a 20-minute drive or a 25-minute light rail ride plus a 20-minute bike ride. We were frequently given rides by American friends.

### **Travel Experience**

During the six-month internship, there are several public holidays and planned leaves, leaving plenty of opportunities for travel. For group trips, renting a car is the cheapest and most practical option. Within North Carolina, it's often the only way to visit certain places. For trips to the West Coast, flying is the only realistic option. Booking early can yield very cheap flight tickets between larger cities. I flew to NYC, Washington DC, and Dallas for under \$100. The most expensive was the round-trip flight to San Francisco, which cost me \$500. By car, you can quickly reach the mountains, such as Mt. Mitchell, multiple national parks, camping grounds, or the beach, like Wilmington or Myrtle Beach, both about a four-hour drive—perfect for a weekend getaway. The five days I spent on Outer Banks beach enjoying the peak summer were the highlight of my travel experience.

### **Summary**

The last semester in Charlotte was one of the best semesters I've ever had. It was an incredible time that I got to share with many new people and friends. I can highly recommend the internship. Through this experience, I met many amazing new friends and researchers, with whom I'm still in contact today, and got to see many beautiful places. I experienced the USA in a truly unique way. The upcoming presidential election in November 2024 also gave me the opportunity to see the "Trump vs. Democrats" political dynamic up close! I'm very grateful to everyone who made these wonderful six months possible. I also learned a lot about how academic research in the U.S. works and how closely the university collaborates with the government and its subsidiaries. Do apply; it's definitely worth the experience! There are few opportunities to do such a straightforward international internship with this level of financial support. Your chances of getting in are fairly high, especially for students interested in the field.

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