To: Nakatani Foundation

Nakatani RIES 2026 Final Report

Your name: Sai Manickavinayagam

Your university: Tohoku University

Host lab in Japan: Biofibertronics (Guo) Lab

Research mentor(s): Tomoki Saizaki, Yuan-Yuan Guo Sensei

Meaning and Impact of the Nakatani RIES Fellowship: How would you describe the meaning and impact of the Nakatani RIES Fellowship on you?

The Nakatani RIES Fellowship provides a unique opportunity to engage in meaningful research while also immersing in Japanese culture. For me, the most important thing it provided was a much deeper cultural experience in Japan than many tourists would receive. Spending 70 days in Japan while also working in a lab gave me a greater sense of responsibility to not only understand but participate in Japanese customs and etiquette. This was further enhanced by the deep connections I was able to make with Japanese natives such as my lab members and other friends I met through the Nakatani RIES program and at Tohoku University.

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Please complete the following sentences with potential applicants to the Nakatani RIES Fellowship as the intended audience.

- My favorite experience in Japan was...
    - Hiking Mt. Fuji with some of the other Nakatani Fellows! It was one of the most challenging yet rewarding experiences I've had in my life. We slept for 2 hours on a mountain hut at the 6th station, which is relatively low elevation, and we hiked to the summit through the night from 7 pm to 3 am. Although the wind made it extremely cold at the top, the sunrise view was my favorite sight in all of Japan. We were also very fortunate to have an Onsen nearby after our descent.
- Before I left for Japan, I wish I had...
    - Planned more of the weekend trips. It's very hard to visualize and outline how every day is going to go in Japan, especially if you have not met your lab yet, but planning as early as possible does save a lot of money. And the more money you save, the more trips you can go on!
- While I was in Japan, I wish I had...
    - Bought more things! I already bought lots of clothes and food, but they are very high quality and much cheaper than in the US, so I would buy as much as possible. Leave lots of extra space in your suitcase for this.

Research Internship Overview: Provide an overview of your research project and your experience during the internship. How did the project relate to your current or future academic interests? What was it like to work in an international research setting?

What did you learn from your research experience this summer, and how has it influenced, or

how do you expect it to influence, your future academic path or research interests?

My research project was focused on addressable surface modification of fiber electrodes that can selectively and sensitively detect different concentrations of dopamine and serotonin. I was responsible for modifying the surface of the electrode with different chemical layers and then testing them in different concentrations of dopamine, serotonin, and common interferents. As my current research is on wearables, the Guo lab allowed me to fully understand electrochemical sensing principles, which will be very important for any future wearables I work on. Working in an international research setting was unique, as communication in the lab was often in layman's terms due to a slight language barrier. However, this allowed me to understand complex concepts much easier and prove that I had a deep understanding of topics by explaining things in layman's terms to some members of the lab.

Lab Environment Overview: Describe the lab environment and the personality and working style of your research group. What was it like to work with your research mentor(s)? How would you describe the overall group dynamic in the lab?

My lab was a tight-knit group with many members around my age. This made us very relatable to each other even though we all came from different cultures, as some members were from France and Nepal. Due to the extra diversity, it taught me a lot about how different parts of the world are. The style of our lab was pretty fast-paced, which I enjoyed as it consisted of intense work for a reasonable number of hours per day. This allowed me to spend the evening exploring Sendai and the weekends further exploring Japan without sacrificing my research progress. My research mentor, Saizaki-san, was very patient and always explained things clearly. He always took a team approach with our work, taking me to all his meetings with Guo-sensei and providing me guidance throughout my time in the lab. The group dynamic of the Guo lab itself is very collaborative, where everyone can understand and ask questions about each other's work and provide helpful suggestions without hesitation.

Daily Life in Japan: Describe your daily life in Japan. You may include the people you interacted with outside the lab, food, your housing and living experience, travel around Japan, challenges you faced, and rewarding experiences you had over the summer.

My daily life in Japan looked different depending on whether it was a weekday or the weekend. On a weekday, I would go to the lab in the morning and make any solutions and fabricate any sensor coating I needed for experiments. Oftentimes I would have a meeting with Guo -sensei during these mornings as well. After lunch with my lab members, including talks ranging from Japanese culture to Lamine Yamal's little brother at the World Cup, I would go back to the lab. I would spend this time running experiments I had to do for the day. At the end, after a quick analysis and discussion with my mentor Saizaki-san about the results, I would leave the lab and take the subway to Sendai Station. After picking up a Zunda shake, I would look around the many stores in Ichibancho and do some light shopping. I would then meet up with some friends for dinner and then come back to the apartment and do some packing for my weekend travels.

Experiences with Japanese Culture: Describe your most meaningful experiences with Japanese culture. These could include program activities, interactions with people in your lab, or experiences from daily life that you feel illustrate aspects of Japanese culture or values. What did these experiences teach you about Japan? What did they teach you about yourself?

My most meaningful experience with Japanese culture would be at the Ramen Jiro shop in Sendai.

I went with my friend, who's also a JP fellow, Aki-san. First, when you go in, Aki-san said a specific order to the chef, and we sat down. While waiting for my food, I looked around at everyone talking with each other yet giving the utmost respect to the food on the table. I ordered a relatively small amount of ramen as I was not very hungry, but at the Jiro shop, the chef was extra kind to me and gave me lots of ramen and a mountain of bean sprouts. I was very happy to see this, but it was a lot of food. I was unable to finish all of it, and most Jiro shops and other restaurants in Japan feel disrespected when the food is not finished. But the Chef was very understanding and was not angry at all, and instead asked me where I'm from. It taught me that while Japan is a country that holds a very high standard for rules and customs, the people are genuinely considerate when even a small effort is made by foreigners to understand and appreciate their culture. Even for something as small as a meal.

Returning to Japan: Do you plan or hope to return to Japan in the future? If so, what would you like to do? What would you need to make that happen?

I would love to return to Japan in the near future. I made so many friends that I want to meet again in Sendai and the JP fellows across Japan. One thing that I will have to do is watch the F1 Japanese Grand Prix at Suzuka with my mentor. Saizaki-san and I have had very long conversations about F1, and he will be working for an F1 engine development team next year, so I will be able to have many more conversations about F1 with him. We agreed that it could be nice to have similar discussions live during a race! To make it happen, I just need a week without any work!