To: Nakatani Foundation

Nakatani RIES 2026 Final Report

Your name: Joseph Ferary

Your university: University of Osaka

Host lab in Japan: Morishima Lab

Research mentor(s): Shoichiro Akiyama

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 has shown me how to navigate a culture vastly different from my own while providing valuable research experience that has further prepared me for my future career. Living and conducting research in Japan challenged me to become more adventurous, confident, adaptable, resourceful, and independent. The experience also gave me a new perspective through which to view American research, culture, and daily life, deepening my appreciation for the differences and similarities between cultures.

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

- My favorite experience in Japan was...
    - Hiking Mount Fuji
- Before I left for Japan, I wish I had...
    - Learned how to speak more Japanese
- While I was in Japan, I wish I had...
    - Traveled more and been more intentional with my research

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 involved developing a muscle-actuated peristaltic pump using insect muscle tissue. During my time in the lab, I helped optimize dissection and muscle stimulation techniques while gaining experience in literature review, experimental design, 3D modeling, circuitry, flexible electronics, image analysis, and coding. I was given substantial independence throughout the project while working alongside an international undergraduate student from Thailand and my graduate student mentor. Although I initially expected the project to be more mechanically oriented than beetle-oriented, it closely aligned with my interests in device development and integrating biological, electrical, and software components. Working in an international research setting was both challenging and rewarding. At times, it was frustrating not to understand conversations without translation, but it was also exciting to see students from multiple countries come together to collaborate on pioneering research.

This research experience taught me how to communicate and coordinate research efforts more effectively, ensuring that each experiment and task served a purpose in informing the next steps of the project. I learned to approach research as an iterative process in which each result, whether expected or unexpected, provides information that can guide future decisions. The experience made me a more independent researcher and strengthened my ability to explain complex concepts to others. It also made me more ambitious in my research endeavors by showing me that I can learn unfamiliar concepts quickly and effectively when I approach them intentionally. Moving forward, I expect this experience to further shape my interest in developing biomedical devices that integrate biological, electrical, mechanical, and software components.

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 had a very laid-back culture, with a few members who were highly diligent in their work, while many of the other undergraduate and graduate students appeared to spend less time focused on their research. My research mentor was in the third year of his master's degree in mechanical engineering, having previously studied architecture as an undergraduate. Because of this, there were times when he lacked some of the technical background necessary to navigate the project, and I often had to explain concepts to ensure that we had a shared understanding of the work. Additionally, my mentor was interested in pursuing a career in banking after completing his degree and spent considerable time preparing for banking exams, which sometimes limited his focus on the research project.

Despite these challenges, the lab was a friendly and collaborative environment. Everyone was willing to help one another with both research and non-research-related tasks, and there was a strong sense of camaraderie among the group. Toward the end of my time in the lab, I noticed that the lab had become more productive compared with when I first arrived. My PI suggested that seeing my work ethic and enthusiasm for research had encouraged other lab members to rekindle their excitement for their own projects and become more diligent in their work. This was especially meaningful to me because it showed me that my approach to research could positively influence those around me, even as an undergraduate working in an unfamiliar environment.

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.

A typical workday for me began around 4:45 AM. I would bike to a nearby Anytime Fitness, work out, return to my apartment for breakfast, and then bike to the lab. I usually worked from around 8–9 AM until 5–7 PM before biking back to my apartment and making dinner. I frequently visited the nearby grocery store, Maruyasu, and prepared most of my meals at home. My apartment was simple but functional, consisting of a bed, desk, bathroom, two mini fridges, a pantry, microwave, single stove, and washing machine. Since there was no dryer, I would dry my clothes outside on the terrace or inside when it was raining or windy.

Outside of the lab, I interacted with people at the gym and spent much of my free time with the other Georgia Tech fellows in Osaka. On weekends, we traveled throughout Japan, visiting Osaka, Kamakura, Kyoto, Sapporo, Okinawa, and Mount Fuji. These trips gave me the opportunity to experience different parts of Japan and helped me appreciate the country's diversity beyond my daily routine in the lab. Balancing a demanding research schedule with independent living and weekend travel made the summer both challenging and rewarding, and it gave me a strong sense of independence and confidence navigating life in a new country.

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?

Food was one of the most meaningful ways I experienced Japanese culture, both inside and outside the lab. Lab members would often bring foods from Japan or other countries they had visited for conferences for everyone to try. I also shared some of my favorite American snacks, including peanut butter, kettle corn, and cookies. Through these interactions, I learned that peanut butter and jelly sandwiches are not common in Japan. My lab's going-away party was a somen party, where noodles flow down a bamboo pipe and everyone uses chopsticks to catch them before dipping them in broth. It was a memorable cultural experience that was both fun and a unique way to connect with my lab members. I also had the opportunity to try foods such as okonomiyaki, takoyaki, and chicken tataki while sharing some of my favorite American foods and restaurants with the lab. Through food, I was able to learn about Japanese culture while also sharing my own.

Another aspect of Japanese culture that stood out to me was a strong sense of integrity and consideration for others. I noticed this in everyday life through things such as bicycles being left without locks, traffic lights without cameras, and people consistently following crosswalks even late at night. Throughout my time in Japan, I was also struck by how willing people were to help me. An older woman helped me when I could not find the Shinkansen, and a man I rented a bicycle from drove both me and the bicycle back to my hotel when it began raining. These seemingly small interactions left a lasting impression on me. They encouraged me to be more intentional about acting with integrity and extending kindness to others, even when there is no expectation of receiving anything in return.

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 hope to return to Japan in the future to explore places I did not have the opportunity to visit during my fellowship and to reconnect with people from my lab, the Japanese Nakatani program fellows, and Nakatani program alumni. Returning would allow me to revisit the experiences and relationships that made my time in Japan so meaningful while continuing to explore more of the country and its culture. To make this possible, I would likely need financial support and the opportunity to travel with other Georgia Tech Nakatani program alumni.