To: Nakatani Foundation

Nakatani RIES 2026 Final Report

Your name: Joongho Sohn

Your university: Georgia institute of Techology – Kyoto University

Host lab in Japan: Taiji Adachi Lab

Research mentor(s): Professor Hironori Takeda

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

Before Nakatani Fellowship, I thought research during undergraduate years would be more about working passively, following protocols that were already set up by professors or phd students. However, during the experience, I learned more about how to think and work proactively due to the nature of how computational research works. I was creating a code that nobody has ever tried before that no one really could give me advice – even Chat GPT. I started learning from scratch. I learned about the basic math principles from Takeda sensei, followed by a flow of knowledge by reading hundreds of papers in the field. I was able to gain a lot of insight, able to think and plan what to do day by day on my own for the project. Even though I was not able to complete the project due to the timely limit, the experience that I have learned opened up my eyes on how to be a better independent researcher.

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

- My favorite experience in Japan was...
    - Traveling in general. Whether it was with a group, or a friend, or alone, I enjoyed traveling nature that was different from United States. I think top 3 would be biking Biwako with mamachari bike, Amanohashidate, and Kamakura.
- Before I left for Japan, I wish I had...
    - Better listening skills on casual Japanese. There were several moments that I couldn't understand some basic Japanese during the stay that I would have to ask worker to explain what it means or to say it again – such as 'do you need a plastic bag' or 'to find the store, you have to go straight for two blocks and turn left'. There were very basic Japanese and I know the words but when the natives speak, it had a specific accent or little fast for me to understand.
- While I was in Japan, I wish I had...
    - More time for research and more money for travel. I think about a week or two week more would allow me to have a firm plan to keep working in United States on the same project (since it is a computational research). And Shinkansen is expensive than I thought. I lived in Kyoto and Kyoto – Tokyo shinkansen for nozomi was about 16000 yen 1 way, which is more than 10 percent of the stipend.

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?
The project was nothing related to my previous research or academic experience as when I was applying for this lab, I specifically asked Adachi sensei to give me an opportunity to research on a topic that I have never would have imagined to work on my life to expose myself into a whole new research environment. As the result, I was able to expose my self into bone cell simulation on growth and response to stress – a field that I would never have imagined myself from working. This have allowed me to be interested in the research area of biomolecular simulation and potentially widened my interest in area of research for my graduate school.
I think international research setting was very similar to my experience in United States but people were more cohesive than I thought. People would work together, go for lunch together, hang out outside of lab together than my experience in United States lab.

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?

The most takeaway from the experience is learning how to become an independent researcher as it has mentioned above. When simulation goes unstable, the failure could be a numerical artifact, a sign error in gradiant calculation, or a model that is simply wrong. Distinguishing those requires building diagnostics - conversation checks, single particle test cases, and estimating the limits of the simulation before touching the full problem. This is the single most transferable experience that I have learned from Kyoto.

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 mentor was always open for my questions, would try to help me out if he finds me struggling with certain steps. He would sit down and solve a problem with me for couple hours if needed, and for certain times where he thinks that I need to spend good amount of time to solve a problem, he would wait about couple days for me until I finally get the answer on my own.

Overall environment of the lab is very good. It is very cohesive environment where people were friendly, willing to help me out in and out of the lab, and go for lunch/dinner together. On monthly basis, there are events that are going on that I could also participate, which was enjoyable too.

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.

I went to izakaya a lot. I liked talking with random people sitting next to me in izakaya and we would become friends. Drinks I liked – Asahi gold, Kirin, yamazaki.

I also liked baseall, my lab formed a softball team have played a softball tournament in Kyoto university. Also with lab members, we have went to see Orix Buffalos baseball game.

Food – Kirameki no tori is the best. I liked hinamatsuri yakisoba. Japansese style curry.

Enoshima pineapple sticks, Osaka and Hiroshima style okonomiyaki, nissin cup noodles, tuna mayo onigiri from seven eleven.

Rewarding experience – completing Biwako biking with mamachari bike, climbing mt. Fuji.

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?

I think the most meaningful experience with Japanese culture is building a daily routine with japanese lab members. I have had two people in the lab always having lunch with me, going to konbini for lunch every day. We also went out to eat dinner at least twice a week together, talking about different experiences, recommendations, etc. Also every sunday night when there is a formula 1 grand prix, I would invite lab members to watch the race with me. I think the feeling that I have been able to be part of the lab culture, spending a lot of time with them, is the most meaningful experience that I have had in Japan.

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 got a suggestion from my lab that if I enjoyed the experience in Japan, I should consider applying to Japan for Masters followed by Ph. D. I am considering applying to Adachi lab for masters as one of my graduate school plans. To make that happen, I think I need to have a convincing information that research in Japan would allow me to keep continue to pursue my goal to become a professor in United States, and also I should have an enough funding to allow me to support my academic journey in Japan.