

My Activities in the MIT Internship

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1. Why did I choose Prof. Richard D. Braatz lab?

Professor Braatz's group deals with the development of advanced control systems of manufacturing processes. Since recent advanced control systems involve solving a variety of optimization problems, Prof Braatz has many experiences regarding the mathematical optimization techniques as well.

My PhD research is the development of the process synthesis method for distillation. Using mathematical optimization methodologies, I am developing the systematic algorithm for finding the optimal configuration of the target process. One of the key points of this research is the proper application of the mathematical optimization methodologies for efficient computation.

Thus, in order to overcome some issues of my research regarding the efficient computation, I decided to visit Prof Braatz and collaborate with him.

2. Cultural differences I felt through the research activity

In this internship, I realized many cultural differences through the research activity. In this report, I would like to mention two of the most impressive ones.

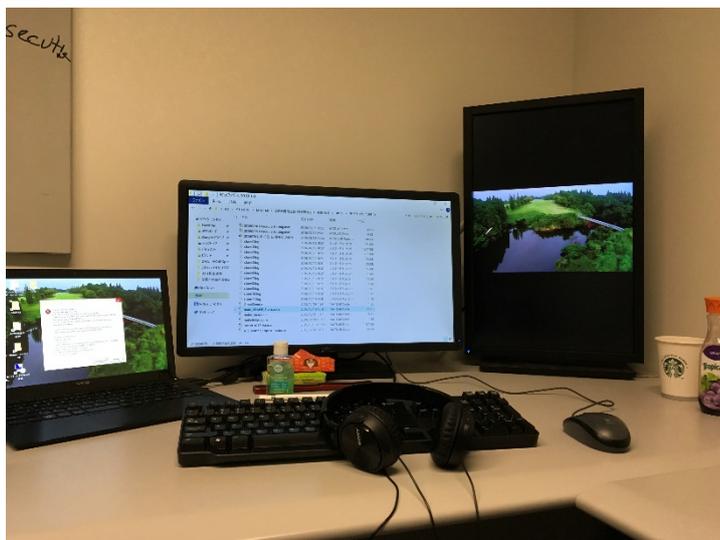
First, the relationship between the members is not hierarchical but flat, as mentioned in the report of Shusaku Asano, too. In Kyoto University, the hierarchical relationships of "Sensei - Gakusei" and "Sempai - Ko-hai" dominates lab. On the other hand, in MIT (at least in Prof. Braatz group), there isn't such a hierarchy. Everyone is regarded as an independent member.

In my view, this difference arises from the differences of the fundamental cultures, e.g. English doesn't have "Keigo", which is a way of speaking Japanese against older people or people of higher position. Both ways should be respected equally. However, I think we, who grew in Japanese culture, can learn many important points from such a flat relationship. It should be especially useful when we contribute to international communities.

Second, the offices in MIT are so well organized to work comfortably: the desks are wide, the lightning is warm color, and



furthermore, all buildings are connected through the underground pathways, so that we can go to another building comfortably even under the terrible weather. Although the investment for such facilities tend to be underestimated, through my three month internship, I felt such facilities really encourage the progress of research activities.



3. Friendship with MIT members

I think international research internships are really useful for constructing global personal connections. I tried to (i) make as many friends as possible, and (ii) establish deep connections with the lab mates.

Fortunately, for the purpose of the encouragement of communication between members, chemical engineering department of MIT has a party every month. Thanks to this party, I could get to be friends with many researchers and students in MIT.

I often had lunch with lab mates and discussed about various topics, from our own researches to political issues. In addition, we have monthly lunch/dinner party. In the each party, one student hosts the party at the restaurant of his/her home country food. Since Prof. Braatz's group is international, we can enjoy various traditional meals. The first party was at a Chinese restaurant, the second was Korean, and finally the third was my turn. Fortunately, Japanese food is so popular in Boston that I could find a nice restaurant and host an enjoyable party.



4. Other notable experiences

4.1. “How are you?” is not just a greeting

In the daily life in Boston, I faced many impressive things off the campus as well as on the campus.

The second most impressive one is that people in Boston are really friendly. They often talk to me by “How are you?”, even if I don’t know them. Since I learned in junior high school that “How are you?” and “I’m fine” are just greetings, I didn’t think they wanted me to describe myself more. So, I replied only as “I’m fine, thank you” for meanwhile in the beginning.

One day, I replied as “I’m fine. How about you?” Then, surprisingly, he began to describe what he did on that day. After that, almost every time I replied “How about you?” people described how their day was, and at last, I realized that “How are you?” is not just a greeting phrase but literally asking one’s condition in detail. As far as I know, people who ask the condition in such a frank way are rare in Japan. Some people may feel this bothering, but I think this is a nice culture.

4.2. People are so interested in politics

The most impressive thing was people’s high interest in politics. As everyone knows, on November 8th, Mr. Donald J. Trump surprisingly won the United States presidential election, 2016. This event let me realize how people in Boston are interested in politics. As far as I know, in Japan, people are not so interested in who our prime minister is. In fact, some people don’t know even the name of our prime minister. In contrast, in Boston, people were so enthusiastic about the election, and so depressed after the election. In fact, some people screamed in public spaces.

5. Acknowledgement

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