インターンシップ体験記　（海外インターンシップの場合は英語で記入）

Introduction

I visited Carnegie Mellon University (CMU) for three months (7/3/2017 – 9/30/2017). CMU is a private university in Pittsburgh, Pennsylvania, USA. CMU is one of the most outstanding research universities, especially known for computer sciences and robotics. I belonged to The Robotics Institute (RI). Christopher G. Atkeson, my host professor is famous for machine learning and optimal control for humanoid robots. Dr. Jun Morimoto, my supervisor introduced me to him.

Goals

I have three goals of this visiting. First, I would like to study machine learning techniques. In Japan, I have worked for controlling exoskeleton robots. Exoskeleton robots are wearable robots, assist users' movements. Designing how to control exoskeleton robots, in other words assistive strategies is an important research topic. However, this research topic remains challenging due to the modeling difficulties of users. In order to deal with this problem, machine learning methods receive much attention. Therefore, I would like to get the knowledge at the forefront of robotics and machine learning. Second, I would like to introduce our work in Japan. RI has a lot of experts of robotics, I can obtain many questions and suggestions. Finally, I would like to interact many professors and students at CMU.

Achievements

My goals were almost accomplished. I learned some machine learning techniques and human modeling from Professor Atkeson for controlling exoskeleton robot. Thanks to him and his laboratory members, I could conduct some experiments with a real exoskeleton robot. He provided me with opportunities for presentations to introduce my research. I was so surprised that many people asked me for the questions and gave me helpful advices. However, I could not answer well, I have to improve my English more. Through the presentation and lab meetings, I could meet a lot of professors and students. This interested me in human behaviors and biomechanical engineering.

Communication in English

I should have practiced English before I visited CMU. Some kind people spoke English slowly so that I could understand, but most people spoke English too fast to track conversations. Sometimes I could not keep up with talking at discussions or lunch and dinner. I made some efforts to learn English during the stay. South Park was very helpful for me. This animation is very coarse, but the stories are available for free with English subtitles and story descriptions.

In CMU, many people always helped me when I needed. They gave me advices for my research and helped my experiment. Of course, no one helps me without any requests, I have to communicate actively with many people.

インターンシップ体験記　（続き）

Daily life in Pittsburgh

Safety: I felt safe in Pittsburgh. It was as safe as Japan. However, Downtown of Pittsburgh was little bit dangerous after dark. Most of the people in Pittsburgh were kind.

Accommodation: I booked apartments with Airbnb. It costs about 150,000 JPY / month, little bit expensive for me, but much cheaper than hotels. I lived in Squirrel Hill and Lawrenceville, safe and beautiful towns.

Food: Generally, food of Pittsburgh is very good. I enjoyed hamburger, pizza, Chinese, Mexican and sushi. It costs about 10 USD for lunch and 30 USD for dinner. The biggest culture shock was that beer was not available at any supermarkets. I had to go shops which sold only beer called beer distributor and submit my ID anytime to buy it. I missed Japanese rice no sooner than I visited USA. Pittsburgh has many Asian supermarkets, I could get the rice easily. I recommend Tamaki Gold.

Sightseeing: I would like to introduce two wonderful places in Pittsburgh. One is Church Brew works. This is the best place for me! It has a beer restaurant in a church. I enjoyed the good beers and the beautiful building. Another is Monongahela Incline. I saw the beautiful view from the height.

Conclusion

I learned a lot of things at CMU and Pittsburgh. I studied machine learning techniques and human sciences. I could meet various backgrounds researchers and get new research ideas. Moreover, I learned the culture of USA and Pittsburgh by living daily life and sightseeing. I should have practiced English more before visiting CMU and I would like to contribute my knowledge to his laboratory's project more if I have more time. From now on, I would like to continue my research for controlling exoskeleton robot. This experience definitely helps my research. I'm really grateful to Professor Christopher G. Atkeson, Dr. Jun Morimoto and Humanware Innovation Program for giving me the precious opportunities.

| Carnegie Mellon University | Church Brew Works | Monongahela Incline |