STEPS Students Report

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As exchange student, I spent August 2018 in Tokyo University. Actually, I did not spend a lot of time when I was thinking about the choice of host laboratory. It is because of the fact that I found the information about Osamu Sugino's scientific group and I realized that this field of scientific interests that is very close to my research field. So I wrote an e-mail to Prof. Sugino about my application to STEPS program, and he kindly agreed to accept me for a month to his lab. For me it was very unusual experience because my qualification is chemistry but Sugino's group is a part of Institute for Solid State Physics. Despite the fact that, I can honestly say that I did not regret my choice at all. There are a lot of interesting areas of condensed matter physics which are being studied in my host lab but most of all I was impressed with the possibility of application of neural networks to the problems of physics and chemistry. Some of Sugino's group members had been having experience in combining of neural networks and ab initio calculations to investigate certain materials properties. I am very appreciating to Prof. Sugino for having a chance to meet with this modern approach in computational science.
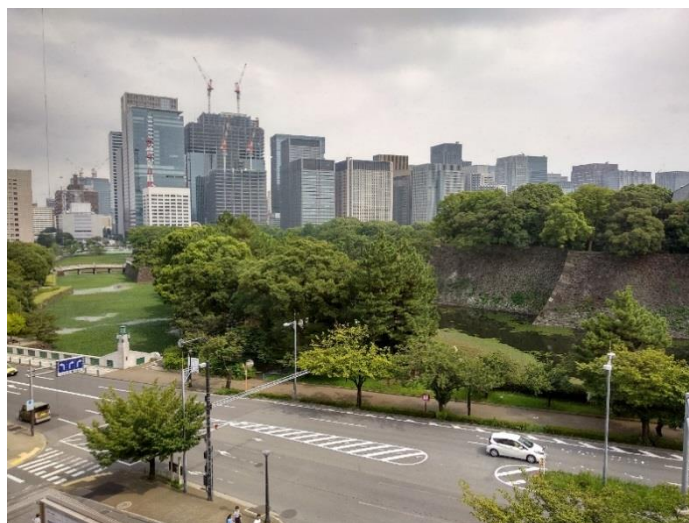
The next step was to learn the main principles of constructing the neural networks (NN) as well as get acquainted with different types of mathematical models, which usually are applied in NNs. One of my research interests is classical modeling (like Molecular Dynamics and Monte-Carlo simulation) of crystals with the aim to find energy and dynamic characteristics of systems. Applying the machine learning approach in this case can make calculations more accurate and relatively faster. So for me making my own NN was the very interesting perspective and I have spent all August doing it. The results were great! It is worth noting that I had a lot of coding practice and gained huge experience in Python language.

Another part of my trip was walking in Tokyo. I have never been to such big city so my first impression was confusion. However, in less than a week I fell in love with this city and was ready to explore it for 24 hours a day. My favorite places in Tokyo were Natural Museum of Nature and Science and National Museum of Modern Art.

Tyrannosaurus skeleton with really small hands.

Not only exhibits in the museums can impress you in Tokyo but also combination of old green gardens with historical buildings and famous Tokyo skyscrapers. Such landscapes look unusual, but naturally as you can see on the photo below.

View of the garden of the Imperial Palace.

Very rich and beautiful culture of Japan has been the object of my continued attention. Actually, I want to admit that the Japanese mentality is incredibly pleasant. To sum up I want to say that this trip was very intense for me both in research and in emotional terms. In addition, if I ever have the opportunity to visit Japan again, I will definitely do it!