

Excellent Graduate Schools program
“World Center of Education and Research for Trans-disciplinary Flow Dynamics”
2014 Internship Program for Students of Tohoku University Experience Report

Name: Yindi Cai

Affiliation: D1, Graduate School of Engineering, Tohoku University

Supervisor: Prof. Wei Gao

Internship Period: 2015/01/05-----2015/02/23

Accepting Institute: the University of New South Wales

Accepting Supervisor: Prof. Liangchi Zhang

Research Topic: Investigation of the interaction between a diamond cutting tool and the machined surface by using molecular dynamics

It was very lucky for obtaining the opportunity and the funding assistance from the Excellent Graduate Schools program office of Tohoku University for this 50 days' internship in the University of New South Wales, in Australia.

The University of New South Wales located on Sydney, which is the one of the famous city in the world. Sydney is not only famous for the beautiful scenery, such as Sydney opera house, Sydney tower and Harbor Bridge and beach, etc., but also for two famous universities, the University of Sydney (USYD) and the University of New South Wales (UNSW). Different from the University of Sydney, the University of New South Wales is established on 1949, it is a young university. But UNSW is one of the Top 50 University in the world. So it was also so lucky for me to study in so good university as an exchange student.



Sydney opera house



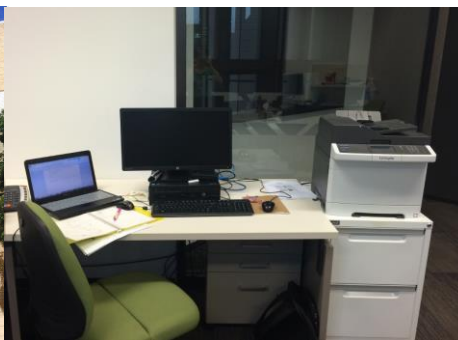
La Perouse

My internship supervisor is Prof. Liangchi Zhang, who is an Australian mechanical

engineer and scientist. As a supervisor, he is a very kindly and experienced advisor. In Prof. Zhang's Lab., the majority of the fellows are post-doctors and PhD students. Some researchers and doctor students in his Lab. also gave me a lot of help for living and support for research.



Campus of the UNSW



Work place in the UNSW

Some planned simulations were implemented successfully on the molecular dynamics (MD) simulation on nanoindentation. Nanoindentation is the most commonly applied means of testing the mechanical properties of materials, and a variety of indentation hardness tests applied to small volumes. When dimension of the microstructure reaches nanometer scales, nano-manufacturing theory and method are essentially different from traditional mechanical design and method. And Molecular dynamics (MD) simulation is a microscopic approach to analyze the behavior of a solid model from atomistic point of view. So MD simulation is widely used.

The daily life in Sydney is fantastic. On the weekday, I spend near 40 minutes to walk to the UNSW, who one of post-doctor in Prof. Zhang's Lab. During this time, I can learn many things not just research but also life from him. The working time is from 09:00 AM to 05:00 PM, and they do not work on weekends. So on the weekends, I always traveled with my new friends, housemates or by myself. One of the economic things in Sydney is the transportation fee is AUD 2.5 during Sunday. In other hand, you only need pay AUD 2.5, you can go everywhere in Sydney you want or the nearest city, such as Wollongong.

It is really memorable for me to attend this program. The cooperation with the scientists of the UNSW is valuable experience for me. And one of the other most importance thing for me is I made many new friends in there, and we spent happy time together and also celebrated the Chinese Spring Festival together. I fell so happy to meet them.

I would like to express my great appreciation to the Tohoku University Excellent Graduate Schools Program for giving me a chance for the international internship. And also I would like to thanks Prof. Liangchi Zhang and his team members for the enthusiastic treat. Finally, I also would like to thanks Prof. Wei Gao and the members of Gao Lab. for the supports so far.