Intel-NTU
Connected Context Computing Center

Spending a Summer with Intel-NTU CCC Center:

Summer Research Program

In this summer, we welcome 17 summer interns from eight different countries to join the summer research program at the Intel-NTU Connected Context Computing Center. The visiting students will be engaged in a variety of research projects during the 8-week program started on June 29th, 2015. The successful program has received many positive feedbacks from previous participants. In this issue of the ICCCC Newsletter, we are happy to invite two students to share their stories and experiences of being an intern at the Intel-NTU Center.

Zhiyong's Story in Intel-NTU Center

By Zhiyong Cui/ Peking University,

In September 2015, I will enroll at the University of Washington (UW) as an PhD candidate of civil and environmental engineering department. Looking back the past year, I still feel very thankful to the experience in Taiwan.

The Intel-NTU Center gave me a chance to gain more than I could imagine. I have studied in National Taiwan University (NTU) and worked in Intel-NTU Center for near half a year from February to June in 2014. By cooperating with the researchers and professors of Intel-NTU Center, I have published one conference paper during the 5 months and two other conference papers after I came back to mainland China. A long-term friendly cooperation relationship between me and the co-workers was established from then on. I believe this relationship and our friendship will last for a long time.

The Intel-NTU Center also gave me a lot of help out of my expectation. My origin target to exchange to NTU from Peking University is to take some courses and know more about the culture in Taiwan by interacting with my classmates and other people around. I was honored that Prof. Jane Hsu, the dean of CSIE of NTU at that time, cared about my study plan in NTU before my arriving at NTU. Considering my interest of research on intelligent transportation, Prof. Hsu introduced me to Dr. Shao-Wen Yang, who champions the research on intelligent

transportation systems (ITS) in Intel-NTU Center. After that, I worked under Dr. Yang's guidance. He also introduced me to work in the Mobile and Vehicular Network Lab (MVNL) leaded by Professor Hsin-Mu Tsai, who is one of my advisors in NTU. Both Dr. Yang and Prof. Tsai impressed me with their wisdom and passion for work.

Sharing ideas and learning other fields can always help us make progress. When cooperating with Dr. Yang, I was encouraged to do a research on estimating taillight signals of front-vehicles using vision-based methods. Since I had no background of computer vision, I came up to Dr. Yang with my new ideas after reading some papers and we discussed about workable solutions every week. We finally came up with a solution combining classical image recognition methods and new techniques of deep learning to solve the problem. When working in MVNL, I also learnt a lot about network and communication, especially the visible light communication. The knowledge of these new fields helped me a lot in the process of my application for studying abroad afterwards.

Now, I will keep doing research on intelligent transportation and data mining in a new lab (STAR Lab) in UW. I have to say that it is the Intel-NTU Center that assists me to find my research interest and leads my way to do research. With the precious experience of working and training in Intel-NTU Center, I will have no fear of the new challenges in the future.

About the Authors

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Life Changing Chance in Intel-NTU CCC Center

By Wen-Bo Lan/ Xi'an Jiaotong University,

I never thought I could have a chance to work at Intel-NTU CCC Center. I was an exchange student at NTU from Xi'an Jiaotong University in Shaanxi, Mainland China. Finding my interest in Computer Vision, I joined Prof. Yi-Ping Hung's research group of Digital Image Processing. Thanks to Prof. Hung, I have this opportunity to work in Intel-NTU CCC Center as an intern.

Life at Inter-NTU CCC Center was arranged with a conventional regularity: we punched in at 10:00 every morning and had lunch together, every week we had a group meeting for lecture and seminar which enlarged my vision and knowledge about this field. The meeting was the most favorite part of my internship because it gave me a chance to take a glance at the latest technologies.

Each of us was assigned to a specific research project with a supervisor and a mentor. Take me as an example, I was working in ImLab under Prof. Hung's supervision with mentor Dr. Chen. In specific, my work was to help to stabilize the ego-positioning accuracy. The team had already

developed an image positioning system using Bundler, a structure-from-motion technique, and ACG-Localizer, a fast 2D-3D image matching technique. However, there were extreme value points appearing so to make it incompatible for vehicle positioning. When I first started my work, I decided to go all the way back to the beginning to figure out what was the problem. By examining the paper and the source code, I found that the system used a matrix to estimate the location of the car from 2D-3D correspond pairs, the very progress was analogous to the projection through a lens. While the original RANSAC process in the system used only the coordinate data. I came up with a hypothesis that the distribution of correspond pairs on the 2D image might impact the result of estimation. To verify my assumption, I did some experiment by attaching a new Scatter Score while applying the RANSAC. The result was encouraging: the modified RANSAC largely reduced the chance by which the peak error occurred. To improve the performance of the entire system, I changed the source code of ACG-Localizer to be more time and space efficiency and wrote Linux shell script to integrate the two separate part of the system. This experience was a life-changing experience to me that I cultivated important skills which laid a solid foundation for me to become a future leader in the industry.

After this internship program, it is my honor to have Dr. Shao-Wen Yang and Prof. Yi-Ping Hung as my reference during the application of Master program in the US. With their strong supports, I was accepted by New York University and awarded a scholarship of 8000 dollars per year. I am faithfully grateful for every staff member in the Intel-NTU CCC Center for this wonderful program. As an EE student, I still have a lot to catch up for my Master Program in Computer Science. However, I believe that the internship at Intel-NTU CCC Center could be a good start for my career and I am looking forward to my new life in New York City.

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