

## Tony Pan's Trip Report of the Weizmann Institute of Science Award 2018

I thought representing Detroit to compete at the Intel International Science and Engineering Fair (ISEF) would be the best way to finish my high school career because I could share my research experience with people from all over the world. Yet, the experience beyond exceeded my expectations: The International Summer Science Institute (ISSI) program at the Weizmann Institute of Science was so much more than that. I have found the program beneficial to me not only academically, but also culturally and socially.



In the 2018 ISSI program, 73 students from 17 different countries are divided into 21 groups in diverse fields of research. Each team is guided by a staff scientist or a professor at the Weizmann Institute of Science to conduct scientific research projects. I am interested in Computer Science and Engineering, so I never imagined conducting a biomedical imaging research. However, the multidisciplinary research at Weizmann enabled us to use Computer Science techniques to improve optical imaging for surgeons. In just 12 days, our research team applied machine learning models and sinusoidal functions to improve the visualization of hidden blood vessels for real-time laser speckle imaging. We created computer programs to generate montages of enhanced medical images that can help medical professionals differentiate blood vessels more accurately and efficiently. Throughout the research process, I was thrilled to apply my computer programming and mathematics skills in the field of biomedical imaging in a way that created an impact that extended far beyond the laboratory. Furthermore, I was exposed to cutting-edge medical imaging technology like two-photon microscopy. Finally, this research project introduced me to and sparked my interest in biomedical research, which I have never done before, but currently would like to continue researching.



Outside of the laboratory, I genuinely enjoyed all the trips and excursions we took around Israel. This was my first time in the country, and the trips far exceeded my expectations. We were offered insights into Israel and the Middle East by not only well-guided tours to the Holocaust Museum, Jerusalem, Haifa, Eilat, the Judean and the Negev Desert, and the Dead Sea, but also unique and exhilarating experiences: we held geo-political discussions inside Kibbutz Almog in the West Bank; we bargained with both Jewish and Arabic merchants in markets in Jerusalem and Tel Aviv; we saw how members of Kibbutz Ketura operated their community; we had conversations with the Druze, Baha'i an, and the Bedouins about their religions and ways of life; we attended lectures on desert architecture, water management, and desalination at the driest place on Earth. From those experiences, I learned so much about the diversity of Israel and the complexity of the Middle Eastern conflicts. Meanwhile, I saw how technology and scientific research eased tension in the region and improved people's lives.



Lastly, I was amazed by the friendships that I formed during the short four weeks. Each participant of the program contributed to an irreplaceable part of the ISSI family. I roomed with friends from Canada, Mexico, the Netherlands, and Israel, and had lab partners from Germany and Canada. I enjoyed listening to and sharing our life experiences, academic interests, past research projects, different points of views, and ambitious plans with one another. I was reminded daily through our conversations and interactions that science, music, and sports, amongst many other things, do not have boundaries. ISSI 2018 has been the best summer experience I have ever had because I have acquired new scientific research skills, saw a different part of the world, and formed incredible friendships with so many talented and passionate future scientists.

