

Joseph Karam  
College of Engineering Electrical Engineering Student  
Oregon State University  
Karam, Joseph <karamj@oregonstate.edu

Testimony Before the Joint Committee On Ways and Means Subcommittee On Capital Construction

Co-Chair Girod, Co-Chair Holvey and Members of the Committee,

For your record, my name is Joseph Karam. I am here today to support the \$75 million capital construction request for the Huang Collaborative Innovation Complex (CIC). I am a senior at Oregon State University studying electrical and computer engineering. During my time here at OSU, I've had the opportunity as an undergraduate to work with two outstanding faculty members, Dr. John Conley and Dr. Mathew Johnston. To simplify, Dr. Conley is an expert in materials and Dr. Johnston is an expert in circuits and sensing. It is an honor to work with such distinguished faculty, especially as an undergrad, and my experience at Oregon State's College of Engineering is NOT unique. Many students are able to participate in undergraduate research because our faculty are accessible and eager to transfer their knowledge to students.

My research, sponsored by HP, involves designing devices for analyzing blood in a way that is much more efficient as well as less expensive than what is currently being used. This involves fabricating very tiny fluidic channels through which we send the blood samples. We do this fabrication in the existing clean room. The CIC will have a new clean room with more up-to-date technology as well as better air and dust filtration – this will make the process quicker and will also produce better results. The research currently being conducted will hopefully make blood tests less expensive and allow people to see their results much faster.

As another example of my research, I designed a radiation detector over the last summer that served two purposes:

First, it detected levels of gamma radiation, which could be useful in determining if an area has harmful levels of radiation or low levels that are not harmful to humans. Second, it determined which radioactive elements were present in the given area. There are a number of elements that can produce gamma radiation, and the detector was able to determine which elements were present. Since gamma radiation is incredibly harmful to humans, this device could be very helpful for people's safety. A device similar to it is already being used on certain national borders to scan vehicles for radioactive material as they pass from one country to another.

I'm very grateful that the research I've done here so far has not only helped better my skills as an electrical engineer but will also one day serve to better society.

Next year I will pursue my master's degree at OSU, and I have been asked to consider staying on to earn my Ph.D. as well. If I did earn my Ph.D. I would be able to leverage some of the facilities planned at the CIC, such as the clean room or the supercomputer. Regardless of my decision, the CIC will have a significant impact on faculty and students as it will support research and education at the intersection of materials science, computation, artificial intelligence, engineering, and robotics to provide solutions for global challenges in areas such as climate science, oceanography, sustainability, and water resources. I am excited for the students of the future – and eagerly wait to learn what they will accomplish there.