Honors Student INFORMS Competition Finalist
“You need to find something you enjoy. If you don’t enjoy the subject you’re looking at, it can be very painful or not enjoyable. Find something you love and are passionate about.”

This is the advice Matthew Eden, a former mathematics and mechanical engineering major at UMass and a current PhD bioengineering student at Northeastern University, has for students undertaking research projects. Eden’s CHC Honors Thesis was selected as a finalist for the 2018 INFORMS Undergraduate Operations Research Prize Competition, and on November 4th he flew to Phoenix, Arizona, to present his paper at the INFORMS Annual Meeting. He presented right after getting off the plane and flew back Monday with a finalist plaque, having enjoyed a day of listening to presentations and discussing research with colleagues. His research was titled “Evolving Contact Network Algorithm: A New Simulation Method for Modeling HIV, a Disease with Low Prevalence but a Critical Public Health Issue in the United States.” Through his project, Eden developed a model to simulate HIV spreading throughout the United States. The purpose of this undertaking was to understand how HIV spreads and to discover the most useful intervention methods.

Eden started his project with UMass Amherst Professor Chaitra Gopalappa, an assistant professor in mechanical and industrial engineering. He credited the faculty with helping him throughout the process, giving him the skills he needed to be a good researcher in his first major research project.

“How many different paths [my research] took me on — that I wasn’t expecting at the beginning,” said Eden. “I started learning about some network science and it took me onto machine learning. It was very exciting to connect the dots and go on this journey to solve this problem. Comparing just the results to what we had at the beginning, it’s crazy how much improvement we saw in the methodology and results.”

In conducting a research project, Eden advised creating a time budget, saying that his budget had helped him incredibly. He said that he approached each day with the objective of completing a set of goals. He would not stop working until he finished the work he designated, refusing to leave tasks to the next day.

“There is not going to be an ‘a ha moment,’ it’s a very long process and you need to be diligent, but you will see results over time,” Eden said.

In general, Eden is interested in taking quantitative background and applying it to problems that affect people’s health or wellbeing. He is currently working on a project that addresses respiratory diseases in wildland firefighters by looking at fluid dynamics to see where particles distribute in their lungs. He explained that research is pretty slow and that it “takes a lot of time to get from A to B,” but that it’s a “long rewarding process.” Eden believes that it is important to look for a topic that hasn’t been studied before.

“In graduate school, I do mostly research. I enjoyed the whole process at UMass and it led me here,” Eden explained. “I wanted to do research before, that’s what made me interested in the Honors thesis, but my project solidified that this is what I wanted to do after UMass and for the next coming years.”

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