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“We hope to augment the academic experience of Ph.D. students with industrial training and further build the successful development of their future careers.” –Hui Yang, professor of industrial engineering. IMAGE: ISTOCK/@DEM10

Stitching it together: Two engineering students spend summer with IBM

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By Miranda Buckheit

UNIVERSITY PARK, Pa. — This summer, two industrial engineering graduate students received National Science Foundation (NSF) funding to supplement their academic research with industrial training.

Siqi Zhang and Runsang Liu both conduct dissertation research in the laboratory of Hui Yang, professor of industrial and manufacturing engineering in the Penn State Harold and Inge Marcus Department of Industrial and Manufacturing Engineering. Yang was awarded extra funding on his existing NSF grant to provide this professional development opportunity for his students. Zhang and Liu spent their summer interning virtually with the IBM Thomas J. Watson Research Center, in the Internet of Things (IoT) and artificial intelligence (AI) groups.

“This was my first internship in industry,” Zhang said. “I think this internship has broadened my perspective. I had to do a lot of presentations, which has helped improve my speaking skills.”

Zhang and Runsang worked on the IBM PAIRS GEOSCOPE project.

According to IBM, the PAIRS platform is designed for massive geospatial-temporal data such as maps, satellite, weather, drone, IoT, query and analytics services. These images and data sets can be so large that the information needs to be stitched together, instead of processed as one fluid product. The result can come out looking flat or misaligned.

The PAIRS platform works to enhance the combination of these kinds of images, easing the process burden on researchers. Users of PAIRS are able to use this information as an accompaniment to their data, improve their applications or develop, test and refine their

models.

Zhang and Runsang worked to help improve the system of PAIRS via deep learning.

“In order to train the model with deep learning, you need to have a lot of samples,” Runsang said. “Image registration is not a new problem, but it remains challenging when you have images taken that are different times, sizes, resolutions and lighting conditions. For example, if you want to track a tree from two images taken in two different time stamps, you will need to first align the two images, which is called image registration, then you can do the following analysis. There is no guarantee one method will excel the others, so you will need to tailor the method to your own dataset.”

Both students explained that they found the internship to be beneficial to their future goals, regardless of whether they stay in academia or move into industry careers.

“You work quickly in industry and you learn so much,” Zhang said.

For Runsang, he found a connection between the internship and his current doctoral studies.

“I may be able to use this experience to help me because doctoral students work fairly independently to solve an issue,” Runsang said. “I think that you need to look at your problem from different angles. The internship gave me an improved ability to solve problems as an individual researcher because I worked so heavily with teams this summer.”

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