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Math professor adds top faculty award to his many honors

In 1960, George Hsiao, a young engineering graduate of National Taiwan University, arrived in the United States, the "land of dreams" as he recalled, beginning a new life.

"I was single, young and had a one-way ticket," Hsiao, now 66, recalled recently during a conversation in his book-filled office on the fifth floor of Ewing Hall. "You had to become successful. For me and my 40 classmates who also came to America, there was no turning back."

Now, four decades later, UD's internationally recognized professor of mathematical sciences--with master's and doctoral degrees from Carnegie Mellon University--was presented with the University's prestigious Francis Alison Award at the fall convocation ceremony.

The $6,000 honorarium and medal are awarded annually to a UD faculty member recommended by peers on the Student and Faculty Honors Committee of the Faculty Senate in recognition of scholarship, professional achievement and dedication.

Interestingly, Hsiao's journey from China to Newark has taken quite a few turns, both geographical and professional. His bachelor's and master's degrees are in civil engineering, but his doctorate is in mathematics.

"I switched to mathematics," Hsiao says, "because I found that, with my engineering background, every time I tried to address a difficult problem I realized that my mathematical background was not sufficient. It's a decision I have never regretted. It's enabled me to look at things from a different angle, in a broader sense."

Hsiao's research deals primarily with mathematics, a field that he acknowledges laypersons have a difficult time understanding.

"My wife, Juliet, is an architect," Hsiao says, smiling. "She teases me and says, 'I don't understand. You play with little symbols. I can see my products.'

"But, she cannot understand why I understand the symbols associated with mathematical sciences, and that's because she cannot see it. But, believe me, we can see it. Like music, mathematics is an international language. It's very hard to describe what we do, but others in the field can understand the research and areas of study that are so very important."

According to a 1997 editorial in the journal, *Mathematical Methods in the Applied Sciences*, honoring Hsiao on his 60th birthday, "G.C. Hsiao is one of the few mathematicians who develop and apply modern mathematical analysis to the modeling of problems in mathematical physics and engineering and, moreover, based on sound mathematical analysis, design new efficient algorithms for the numerical solution and

simulation of these problems on modern computers. This is a very wide range of interests and shows his extraordinary abilities."

Hsiao explains that, in math sciences, researchers deal with two important questions--the existence and the uniqueness of solutions to the problems. In fact, he adds, some problems may have no solutions, but it is the researcher's task to find that out--or discover how close one can come to a solution.

"Much of the work we do today is a blend of engineering and math," Hsiao says, "and I would not have been able to do my work without my knowledge of engineering."

"I'm classified as an applied mathematician," Hsiao says, "which means I use mathematics as a tool to solve practical problems."

For example, mathematics is used for stress analysis on aircraft.

"It's essentially an engineering problem," Hsiao says, "but you need mathematics to obtain accurate results. I tell my students that to succeed in the future they must have an understanding of the terminology and principles of various disciplines that work together."

Hsiao is a member of the UD team involved in MURI--the Multidisciplinary University Research Initiative Project of the Advanced Research Projects Agency--for the U.S. Air Force Office of Science Research. This five-year, $4.5 million grant project also involves UD math faculty members Tom Angell (principal investigator), David Colton, Allan Dallas and Peter Monk. Along with scientists from the Colorado School of Mines, Virginia Polytechnic Institute, University of Arizona, Massachusetts Institute of Technology and New Jersey Institute of Technology, the UD team is working on the development of sound mathematical foundations for the construction of effect code for the electromagnetic problems of direct concern to the Air Force.

"It's important to use math to determine how accurate we are and, if inaccurate, to identify what our level of error may be. We also try to identify our error estimates and try to improve upon them," Hsiao says. "The fun or enjoyment of being a researcher is the joy we get from our work as we try to find new things. And, this is something you can understand only if you have experienced it."

While Hsiao's comments about his research interests are enthusiastic, his tone is even more so when he is discussing his involvement with students and their accomplishments.

"I love teaching!" Hsiao says, reaching out to show the letters and gifts that he has received over the years. "The students give me inspiration. You cannot do research 24 hours a day. You need some change of pace. I have been fortunate in my 31 years at the University. I've had many good students. Some do research with me even after they have received their degrees. They also contact me for opinions when they have difficulties with their own research projects."

Holding up a coffee mug, Hsiao explains that it was a gift from former student Gabriel N. Gatica-Perez, AS '89 PhD. Hsiao's chipped and stained cup bears the inscription: "That man is a success who brings out the best in others and gives the best of himself." Gatica-Perez is currently chairperson of mathematics at Universidad de Conception in Chile.

Hsiao's other interests include music, theatre and painting. His interest in photography helped him fund

graduate school by working as a wedding photographer. He says he also enjoys sketching buildings when he has time, which, he says, "is not too often."

Hsiao looks around his office that overflows with books--on shelves, on the floor and six levels high across his desk, with assorted volumes leaning up against office furniture.

"I am surrounded by my great fortune," he says, spreading his arms wide. "This is my treasure. I am the king of the books. I enjoy reading and working. Work is part of my relaxation.

"If I don't do any work for even one day," he says, "I feel guilty. I feel restless. I guess that's from my days as a graduate student."

When one of his students claims there's not enough time to complete a project, Hsiao's response is, "Make time! If you want to do it, you can do it."

And, the secret of success?

"To have a good wife," he says, smiling. "You must have a good family to support your efforts. That way you can put your mind to your work without worrying about your home and family. When I travel, I know everything at home is taken care of and I can concentrate on my work."

Hsiao's family includes three UD graduates--daughter, Barbara Chi Hsiao Silber, AS '89, senior archaeologist for MTA Engineers and Planners in Collingswood, N.J.; son-in-law Greg Silber, AS '93; and son Jeffrey Hsiao, AS '92, a computer science consultant with Siebel System Inc. in Reston, Va.

Regarding Hsiao's Alison Award, Pam Cook, chairperson of mathematical sciences, says, "We were most pleased to hear that George Hsiao received the Alison Award for 2000. Dr. Hsiao has an outstanding international research program and reputation in his area of expertise, boundary element methods. More than this, though, within the department and the University, he is especially valued for his excellent and continued success in supervising and mentoring graduate students."

Over the years, Hsiao has received numerous awards and been recognized for his work by colleagues around the world. When President David Roselle called Hsiao to congratulate him on receiving the Francis Alison Award, the mathematician says he was both surprised and proud.

Hsiao pulls out a printed piece of paper and says, "A previous Alison Award recipient, Stanley Sandler, says, 'It is nice to be recognized in your own community by people who know both good and bad about you.' I think that is true, and the fact that I have been accepted by my own community is very important.

"The Chinese have a proverb, and I don't know the exact words, but it's something like this: 'When the monk coming from far away rings the bell, the sound is much louder than if the bell was rung by the monk at home.' Normally, institutions and groups overlook their own and recognize experts from beyond their community. That is why this award is especially satisfying to me."

-Ed Okonowicz, AS '70, '84M