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Researcher Spotlight: Dr. Jun Zhuang

BY KERI ENRIQUEZ

Growing up in Nanjing, China, [Dr. Jun Zhuang](#) envisioned himself as a professor at a young age. His interest in mathematical modeling gave rise to an Industrial Engineering degree from Southeast University in China.

After accepting a graduate research assistantship position, he relocated to the University of Kentucky to earn a master's of science in Agricultural Economics, then to the University of Wisconsin-Madison to earn a doctorate in Industrial Engineering. Zhuang received a START grant "Validating Models of Adversary Behavior" to stimulate research in existing model validation, and demonstrate the validity and applicability of theoretical and empirical research to real-world problem solving.

Zhuang was awarded the 2013 Exceptional Scholar-Young Investigator Award by the University at Buffalo, where he is an Assistant Professor of Industrial and Systems Engineering.

How did your interest in terrorism begin?

My Ph.D. advisor at the University of Wisconsin-Madison, Vicki Bier, believed my background in economics could complement her work in a new DHS-funded project at the National Center for the Risk and Economic Analysis of Terrorism Events (CREATE). We successfully researched the utilization of game theory in the studies of terrorism, and Vicki has remained the most influential person on my career ever since. She is my role model and we have remained close friends, exchanging over 2,000 emails in the past five years alone.

How does industrial engineering or agricultural economics apply to terrorism?

I use the methodology of systematic thinking, game theory and optimization to study strategic interactions among defenders, between defenders and terrorists, and among terrorists. I hope to explore a new class of decision models that would provide structural insights for counter terrorism policies. My long-term research goal is to integrate operations research, game theory and decision analysis to improve mitigation, preparedness, response and recovery for both natural and man-made disasters.

How has involvement with START shaped your research?

One of the main challenges in my research is the lack of appropriate data to validate my models, and START's Global Terrorism Database ([GTD](#)) provides data that motivates, verifies and illustrates some of my models. In addition, [Gary Ackerman](#) and I have been working on game theoretic modeling of interactions between terrorism groups since 2008, and START continues to provide excellent networking opportunities for potential research collaboration. START has also directly supported my research through the project "Validating Models of Adversary Behavior," funded through the DHS Science and Technology Directorate's Office of University Programs.

As a result of the grant, my team and I held a successful three-day conference on the project to discuss the theoretical and empirical sides of adversarial modeling. I am currently working on a special follow-up journal issue on the results of the conference.

What else are you currently working on?

The National Science Foundation is funding my three main ongoing projects. The first is directly related to terrorism and is entitled "Robust Approval Process in the Face of Strategic Adversaries and Normal Applicants." The second project is about partnership dynamics in natural disasters called "Doctoral Dissertation Research in DRMS: Modeling the Dynamics of Agency-Agency Partnerships before and following Extreme Events." The final project is about both terrorism and natural disasters, known as "Incentives in Government Provision of Emergency Preparedness and Disaster Relief." Several of my other research projects are funded by CREATE and The Department of Energy.

You've been recognized with the 2012 President Emeritus and Mrs. Martin Meyerson Award for Distinguished Teaching and Mentoring. Why is it so important to be a mentor to young researchers?

I mentor students not only because it's important, but because I enjoy working with new generations of researchers. I take pride in seeing them learn, grow, and witnessing their "Aha" moments. We as professionals are responsible for the ability of future generations of researchers and practitioners to produce sustainable research. I would encourage young researchers to follow your passion, listen to your advisor, and be persistent.

What are your plans for the future?

Short-term plan: Get tenure soon! Long-term career plan: To become an academic leader in the strategic use of mathematical modeling of operations research, game theory and decision analysis to gain insight into disaster and security problems.

Outside of your roles as professor and researcher, what do you do for fun?

I enjoy spending time with coworkers and family, including my three lovely kids. I am active in my church community to worship, serve, learn and grow together. I also play piano, percussion instruments and sing for my church worship team. I am also fond of photography, and volunteer to photograph my department and church events.



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