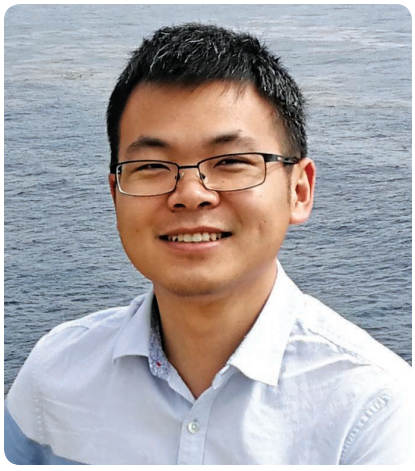
LI WANG

Q. How did your education and early career lead to your initial and continuing interest in the control field?

***Wang*:** I knew little about control theory during my freshman year. I was fortunate to join Prof. Peng's lab that worked on precision manufacturing. I was deeply impressed by the fact that those high-precision machine tools could turn a piece of raw material into a delicate part that looked like artwork. That experience motivated me to learn more about how those systems and algorithms work.

As I took more classes on control theory, I became fascinated by how mathematically rigorous it is. I began to realize that those commercial airplanes and rockets could function reliably partially due to the rigorously designed control algorithms behind them. Learning more about how robotic manipulators, planes, drones, spacecraft, self-driving cars, and other control dynamic systems work made me even more excited to work in the controls research field. I decided to work on a controls Ph.D. degree in Prof. Magnus's lab. I enjoyed spending lots of hours in the lab working with remotely controlled mobile robots and drones and watching my algorithms turning into reality. Those intellectually challenging and rewarding experiences contribute to my continued interest in the controls research field.



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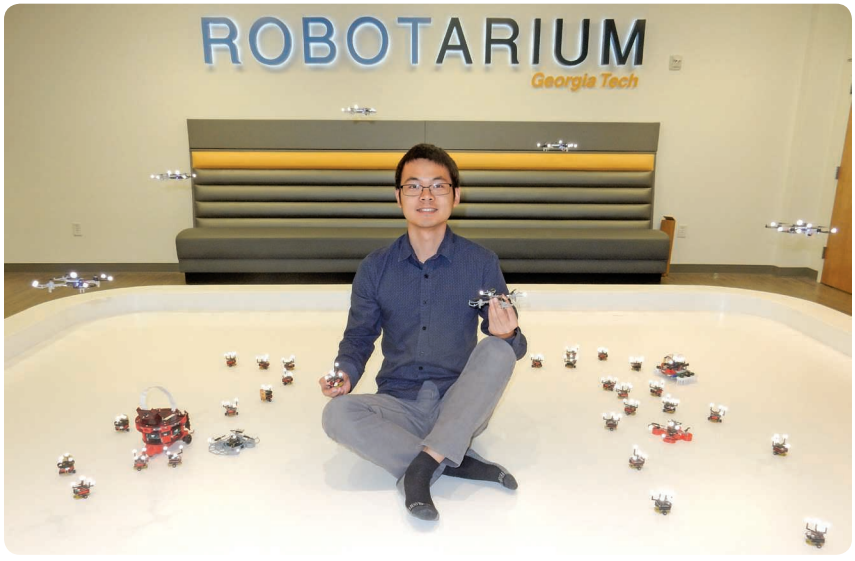

Li Wang at the Robotarium with a team of Crazyflie drones and GRITSBots used in his research projects at the Georgia Institute of Technology, Atlanta.

Q. What are some of your research interests?

***Wang*:** I am interested in developing control algorithms for agile dynamic systems that operate safely in challenging scenarios. I care a lot about the combination of rigorous theory and its practical application. My current work is related to developing safe, robust, comfortable, and efficient control algorithms for self-driving cars.

I am fascinated by the self-driving car industry because the technology has the potential to completely change our transportation system. It could make people's daily commute and tiring, long trips much safer, efficient, and enjoyable. That work involves integrating advanced learning, sensing, prediction, and control techniques to create an intelligent and robust system. There are lots of challenges that control algorithms need to address correctly before we can achieve full self-driving. Problems like dealing with sensing inaccuracies and dynamic environments are very interesting and challenging to solve. It is also very important to guarantee safety during evasive maneuvers and on wet/icy roads where the car operates close to the tires' limits. I am convinced that solving those controls problems could have a positive impact on our society.

Q. What are some of the most promising opportunities you see in the control field?

***Wang*:** I see great opportunities in using control theory to understand and interact with large, complex networked systems, such as traffic systems, social networks, and the Internet of Things. Currently, we lack a good understanding

Profile of Li Wang

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- *Notable awards*: IEEE International Conference on Robotics and Automation Best Multi-Robot Systems Paper Award (2017); American Automatic Control Council O. Hugo Schuck Best Paper Award (2019).

of how to model those interactions and influence them to evolve in a way that improves human life. Breakthroughs in this area can greatly increase the impact of controls community.

I am also excited by the idea of combining rigorous control theory with powerful machine-learning techniques to solve some challenging practical problems. The successful application of control algorithms often requires a good model of the interested system. However, it is sometimes very difficult or even impossible to obtain such a model due to uncertainty and changing environments. In such cases, we can use machine-learning algorithms to derive a model with certain confidence to succeed. If we can develop control algorithms that are tailored to compensate for the weakness of the learned model and provide some performance and safety guarantees, it will enable us to apply control theory to solve lots more practical problems in a better way.

Li Wang and his wife, Congshan Wan, hiking at Moraine Lake in Alberta, Canada.

Q. What are some of your interests and activities outside of your career?

***Wang*:** Outside of my professional career, I enjoy hiking, skiing, boating, and getting closer to the beauty of nature. I am fortunate to live in California, which is full of scenic beaches, mountains, and national parks. I try to visit different places every other week to refresh and get inspirations.

Q. Thank you for your comments.

IASSON KARAFYLLIS

Q. How did your education lead to your initial interest in the control field?

***Iasson*:** I remember that I was very much impressed by the fact that differential equations can actually describe the world. I was later attracted by stability theory. I became aware of the fact that stability theory is mainly used by control theorists. I then decided that control theory was the right area for me.

Q. What are some of your research interests?

***Iasson*:** I am particularly interested in nonlinear systems and control theory. My interest is mainly in the solution of feedback stabilization problems and observer design problems for all kinds of deterministic systems: systems described by ordinary differential equations, partial differential equations (PDEs), delay systems, and discrete-time systems. I am also very much interested in applying the results of mathematical control theory to other areas of mathematics.

Iasson Karafyllis (left) with Miroslav Krstic at the 2019 IEEE Conference on Decision and Control.

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