

AMSI Scholarship Profile - Summer School 2022

SHIDAN LIU

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Student name: Shidan Liu

Position: PhD Student

University: Monash University

Biography: I'm currently a second-year PhD student in Financial Mathematics at Monash University, supervised by Ivan Guo . Before this, I did a Bachelor of Science in Statistics at RMIT University and then did an honours year at Monash University, where I continued into my PhD journey afterwards. (Before all this, I obtained a Bachelor degree in Telecommunications Engineering at Tongji University, Shanghai China, and worked as a telecommunications engineer for a year.) I study the robust pricing-hedging duality problems of American/game-style options.

1. *Can you give me a quick overview of the type of mathematics you are studying and its potential impacts for the broader community (think how you would explain your work and studies to friends who don't study maths)*

In the pricing of financial derivatives, a model is often assumed to be describing the price dynamics of the underlying assets. But the problem is, how do you know this is the right model? My study of the robust approach to pricing financial derivatives aims to address this model mis-specification risk, by considering a family of all possible models.

2. *How did you get into mathematics/statistics/data science? Was there someone or something that inspired you to this field?*

I've always liked problem solving, but didn't know I could do mathematics. I started in statistics, and completed an AMSI vacation research project in mathematical finance in the summer of 2019, which led my way into financial mathematics. I think it was my then honours supervisor and now PhD supervisor, Dr. Ivan Guo, that has

inspired me the most during this journey. The way he connects basic ideas and explains things in a comprehensive and intuitive way, has made me even more interested in this subject, and motivated to be better at it.

3. *You received a scholarship to attend AMSI Summer School 2022. How important was this in terms of your ability to attend, fully participate in the program and meet others studying in similar fields?*

I truly appreciate this scholarship from AMSI to help me fully participate in the program. It was also a relief mentally, as I didn't have to worry about funding and could fully devote myself into the courses.

4. *The purpose of Summer School is to give students an opportunity to develop their mathematical skills, meet like-minded people and network with potential employers. What was the most valuable part of the program for you? Was it the course content or the people you met? Do you have new ideas for your work/research or see it in a new light?*

Both. I learnt a lot of new stuff, maths that I haven't been exposed to much. I also enjoyed the group coding project, which gave me the chance to see how other maths people would approach the same problem in a way different to mine. It is also much fun watching questions asked and answered in the lectures. A lot of the times, they are questions I've never thought about before, and hence provide a whole new perspective to understanding the topic.

5. *Summer School included a special Careers Day program which aims to help give students an idea of the kinds of career paths available to maths graduates in industry and private sector research areas. Were you previously aware of the types of industry opportunities available to mathematical science graduates? Would you consider working with industry? Do you feel better equipped to explore career options in the mathematical sciences after attending AMSI Summer School?*

I was aware of the types of industry opportunities available, but the career day events have certainly provided a lot more insight and information on what people really do every day in their job. I'd like to keep my options open, so yes I would consider working in industry. And I also think the summer school courses has prepared

me somewhat better for the industry jobs, as they are more practical (for instance, machine learning and programming in R).

6. *AMSI Summer School was held as a virtual event. What was the biggest positive from your point of view holding it in this format and/or the biggest challenge?*

I'd say the biggest challenge was not being able to interact and communicate, physically, with others. I think eye contact, facial expressions are crucial in establishing connections. The whole thing wasn't quite as efficient as it would be in an in-person event. For example, maths are difficult to write down and to read in the chat box, and some questions could even be answered right away by someone sitting next to you.

7. *What advice would you give to someone who is considering applying for Summer School in 2022? Should they apply and why?*

If there's a subject that really interests you and you want to explore or learn more maths, then go for it. But if meeting more like-minded maths people is your primary goal, it is probably better to wait for an in-person event.

8. *Where do you want the mathematical sciences to take you? Where do you see yourself in five, ten years time?*

I appreciate the critical, logical thinking and the rigorous reasoning mathematics has taught me, and I believe I'd benefit hugely from this wherever I'd be in five, ten years time, industry or academia.

9. *Any other feedback/comments you would like to provide on the AMSI Scholarship or AMSI Summer School 2022?*

Just wish it could be in-person next year. Fingers crossed.