

IGS Scholar's Name: Li Cheng

Research Centre: Singapore Centre for Environmental Life Sciences Engineering

1. Your current employment details (Designation, name of company, country and scope of work)

I am currently working as a project officer in MAE, NTU, Singapore. My PhD study focuses on individual-based modeling for biofilm structure control, which is also the major project of my current work. I am still trying to improve the biofilm models to study the effects of different factors on biofilm growth.

2. What motivates or trigger you to pursue a doctorate?

My undergraduate studies were quite diverse which involved courses on mechanics, electrics, and optics. However, due to the many subjects involved, it was difficult to go deep in a specific field. I felt that I need to go for a doctorate that focuses on one project to prepare myself for my future career.

3. Why or how did you decide to apply to IGS or the interdisciplinary route of research?

It was interesting and illuminating to interact with people from different fields. I believed that people from different backgrounds can give different perspectives to one task. I applied to the interdisciplinary route of research also because I wanted to try things out of my background to decide my interest and strength.

4. What is your thesis about?

My thesis title is individual-based modeling for biofilm structure control. In the thesis, I discussed the major findings of my research on applying mathematical models to study biofilm structure formation under different conditions, such as different detachment or oxygen availabilities. I also validated the modeling results using experimental data. The results demonstrate the potential of using a mathematical modeling approach to prioritizing the physicochemical factors according to their effect on biofilm structures.

5. Why did you choose this topic and how does it benefit people or industries globally or internationally?

I chose this topic because biofilms are complex systems and mathematical modeling could serve as an important and useful tool to study biofilm development. However, less attention has been paid to biofilm mathematical modeling compared to biofilm experiments. Biofilms are everywhere and can be beneficial, such as those used for wastewater treatment, or detrimental, such as those formed on the teeth. My studies could be further developed to control biofilm formation.

6. What kind of interaction did you have in IGS? How did that help you?

I had the opportunity to learn from people of different backgrounds by attending the seminars. Besides, I got to know the different perspectives when handling a problem and the different skills when communicating with people. These can help not only open my minds but also improve my communication skills.

7. What are the challenges you faced during the candidature and how did you overcome it?

It was challenging for me at first to study biofilms as I had no background knowledge in biology or microbiology. To overcome this challenge, I have read a book on microbiology and read many papers. At the same time, I frequently talked with my colleagues whose major is microbiology.

8. What was your proudest moment or fondest memories over the years of candidature? E.g awards, overseas conference, patent, published papers, etc.

There were two such fondest memories during my PhD studies. One was when I got the email that my first manuscript has been accepted for publication. The other was when I went to the conference in Porto. In the conference, I met many people studying biofilms from different perspectives and I had a good time there.

9. What do you think are the attributes for PhD students to successfully go through the 4 years?

I think there are at least three most important attributes for PhD students, hardworking, independent thinking, and perseverance. First, PhD students need to be hardworking to finish the designed projects on time. Then, independent thinking is required to identify the research gaps. Finally, as many problems may occur, perseverance is needed to overcome these challenges.

10. Please share 1 key motivational/ key take away message with your juniors?

Supervisors are very important but the PhD student needs to be able to find his/her own direction or interest.

11. How does it feel like when you received the scholarship offer?

I was very happy when I received the offer. I was also looking forward to the coming challenges. As it was the first time for me to go overseas, I was very curious for the life in Singapore.

12. Share with us some memorable photos you've taken with 1 line description of each photo. (e.g. Overseas conference, interactions in IGS, etc)



Group badminton on Dec. 29, 2016.



Sunset on Oct. 2015. Taken from Canteen A.

13. What will you miss after graduating?

I think I will miss my roommates and friends after graduating. I will also miss the student life in NTU.

14. What is your next adventure / challenge or any plans for the future?

I am planning to go back to China and find a job near my hometown.

15. Is there anything you want to say to your family, supervisors, mentors, friends or anybody?

I want to thank my family for their support in these years. I would like to thank my supervisors and mentors for their guidance. I would also like to give my appreciations to my friends for their companionship.