NUS ESP alumnus shines at MIT – conferred Exceptional Performance Award in his first year

NUS Engineering graduate Huang Wenxuan has never looked back since he joined the Faculty’s Engineering Science Programme (ESP) and Global Engineering Programme (GEP) in 2010. After attaining his B Eng (Engineering Science) degree in just three years, he went on to do his PhD at the Massachusetts Institute of Technology (MIT) where he was conferred the First Year Graduate Exceptional Performance Award.

For his course work which comprises four core courses, Wenxuan scored ‘A+’ for two courses, and ‘A’ for the other two. He also shines in his research, coming out with breakthroughs which his supervisor is extremely happy about. This is a great feat, as scoring ‘A+’ at MIT is indeed a rarity.

Commenting on why he has chosen GEP in NUS as the pathway to success, Wenxuan said, “GEP offers students excellent opportunities for overseas exposure at topnotch universities. GEP is also an accelerated pathway which enables students to complete their engineering degree in just three years instead of four. This enables one to stretch and realise one’s potentials.”

Through GEP, Wenxuan was able to attend summer classes at UC Berkeley. “This is my first exposure to the US academic and social system. Upon returning, I spent another semester at the University of Toronto as part of a student exchange programme. These experiences have really helped me to embrace different cultures and to adapt well to different social norms.”

Now at MIT, Wenxuan is developing a method to determine the exact ground state (lowest energy state) of a lattice model. For 20 years, exact ground state determination remains an unresolved problem. The "Monte Carlo" method is currently the only tool in resolving exact ground state problem. However, due to its statistical nature, there is no way to guarantee that the low energy state obtained is absolutely the lowest.

"My project is hence, to develop a rigorous mathematical method that could determine the ground state and also prove that the ground state obtained is the true state. This is really an exciting project for me because it requires me to integrate different aspects of knowledge I’ve learnt in mathematics, computer science and materials science," said Wenxuan.

He added that while solving problems, he has also picked up new knowledge and skills. This bright young man has been picking up many bouquets as well. For example, one of his supervisors has commented that Wenxuan has provided a "deep and fundamental approach towards the problem" and that it works “like magic”!