

Coding & Cryptography is their business



Prof Ling San (second from left) and his team. From left to right: Prof Xing Chaoping, Prof Ling San, Prof Wang Huaxiong and Prof Frederique Oggier.

Algorithms, coding and cryptography may sound like terms from a summer blockbuster on the exciting world of commercial espionage, but they do not detract far from our daily lives and applications.

With the ubiquity of online social networking (think Facebook), electronic business transactions and commercial activities comes a

growing concern for both security and reliability. This is where coding and cryptography, respectively, come in, and with them, a team of researchers raring to hit the labs with their complex theories, intricate mathematical formulae and elaborate equations.

Prof Ling San, the team's honcho also known as the Principal Investigator (PI), is Chair of the Nanyang Technological University's School of Physical & Mathematical Sciences. Together with six co-PIs, Prof Ling's programme seeks to develop theories, methods, techniques and tools in coding and cryptography that can be applied to areas and industries such as finance, defence, security, communications and health. The programme was one of four selected in the second round of the National Research Foundation's Competitive Research Programme (CRP) Funding Scheme, announced in June 2008. Each of these four programmes will receive up to S\$10 million in research funding over three to five years.

While the programme, which comprises seven interdisciplinary sub-projects, is heavy on the basic theoretical nuts and bolts, the team will also take into account practical considerations and look into the implementation phase – putting their theories into practical use.

The dynamic team is made up of researchers and academics from the areas of mathematics, computer science, and of course, the related fields of coding and cryptography.

Ask any member of the team the fundamental objective of the project and the answer is a quick one: To achieve research breakthroughs, as well as attract and train talent.

Prof Ling said: “Our aim is to conduct outstanding research and generate good ideas. From this, we hope to attract talent and train manpower. These achievements will help lift Singapore’s international prominence and put her on the map in the field of coding and cryptography.

“Also very close to our hearts is the desire to help our local industries, such as defence and communications, with higher levels of security and reliability in our transactions, systems and storage.”

Given the global demand for safe and dependable transactions, as well as the constantly evolving models and paradigms, it is – most literally – a race against time to come up with the best theories, techniques and tools.

Prof Ling sees his team, which he counts as his best asset, as a unified entity. He said: “Our team is a tapestry where our strengths and interests – some of which are overlapping – are interwoven together. I am confident and optimistic that we will come up with a breakthrough which will make a difference in the field of coding and cryptography.”

About the team:

Principal Investigator

Prof Ling San (NTU)

Co-Principal Investigators

Prof Chee Yeow Meng (NTU)

Prof Wang Huaxiong (NTU)

Prof Xing Chaoping (NTU)

Prof Frederique Oggier (NTU)

Dr Kees AS Immink (Turing Machines Inc., The Netherlands)

Prof Igor Shparlinski (Macquarie University, Australia)
