

QUAN QUAN TAN

<https://quanquantan.github.io/home/>

quanquan001[at]e.ntu.edu.sg

EDUCATION

Nanyang Technological University, Singapore

July 2019 - Present

- Pursing Doctor of Philosophy under the Mathematical Sciences Department
- Research topic: Applicability of Machine Learning in Cryptanalysis
- Nanyang President Graduate Scholarship (NPGS) holder

Nanyang Technological University, Singapore

July 2018 - July 2019

- Graduated with a Master of Science (Research) under the Mathematical Sciences Department
- Research topic: Optimising Implementation of Block Ciphers

Nanyang Technological University, Singapore

July 2015 - July 2018

- Graduated with a Bachelor of Science with Honours (Highest Distinction) under the Mathematical Sciences Department, specialising in Applied Mathematics with a CGPA of 4.96/5.00
- Dean's List for all three consecutive years from AY15/2016 to AY17/18
- NTU President Research Scholar: Completed Undergraduate Research Experience on Campus (URECA) Programme with Distinction
- Center for Strategic Infocomm Technologies (CSIT) Undergraduate Scholarship holder
- Minor in Computing and Data Analysis

Yishun Junior College, Singapore

Jan 2011 - Oct 2012

- Six Distinctions in Singapore-Cambridge GCE A levels 2012
- Best in Subject Award (Physics) in 2012
- Best in Subject Award (Chemistry) in 2011

RESEARCH

Optimising Implementation of Block Ciphers

The project aims to reduce the number of logic gates involved during the implementation of a cipher's linear layer. We managed to design a new heuristic that is better than the state of the art construction for relatively small matrices. We are also trying to design a heuristic that can work well with large matrices. Here is the link to the first eprint paper on this topic: <https://eprint.iacr.org/2019/847.pdf>

Applicability of Machine Learning in Cryptanalysis

This project aims to look into the applications of various machine learning algorithms to aid in the cryptanalysis process of ciphers.

SKILLS AND COMPETENCIES

Language Proficiency

English, Mandarin

Software/Hardware

C++, Python3, MATLAB, Verilog

Tools

Basic MS Office, Latex

WORK EXPERIENCE

Nanyang Technological University, Singapore

Graduate Lab Tutor for PS0001 Introduction to Computational Thinking *Aug 2019 - Present*

- Assist in coaching undergraduates in basic Python programming

Undergraduate Lab Tutor for MH1402 Algorithms and Computing 2 *Jan 2018 - May 2018*

- Assist in coaching undergraduates on the topic of algorithms

Center for Strategic Infocomm Technologies, Singapore

Research Intern *May 2018 - July 2018*

- Research area focused on Quantum Key Distribution protocols
- A review of the security features in a text messaging application

Private Tutor

Mar 2016 - Dec 2017

- Tutored H2 Mathematics at GCE A Levels and Additional Mathematics at GCE O Levels

Defence Science Organisation

Research Intern *Feb 2015 - May 2015*

- Research in a project from the Electronic Systems Department

Singapore Armed Forces

Feb 2013 - Dec 2014

- Attended Armour Company Sergeant Major Course and was awarded the Top NSMEN Award *Jul 2018 - Aug 2018*

- Attended Armour Platoon Sergeant Major Course *Jul 2014 - Jul 2014*

- Appointed as a Vehicle Commander *Dec 2013 - Dec 2014*

EXTRA-CURRICULAR

Nanyang Technological University, Singapore

Member of Tennis Recreational Club *Jan 2019 - Present*

Business Director for School of Physical and Mathematical Sciences (SPMS) Freshmen Orientation Programme *Aug 2016 - Aug 2017*

- Responsible for searching and liaising with sponsors and raise funds for the camp
- Lead a team of 4 sub-committee members in contacting sponsors and search for canvassing projects

Facilitator for SPMS Freshmen Orientation Programme *Aug 2016 - Aug 2017*

- Facilitated a group of 20-30 freshmen in a series of planned activities
- Fostered a platform for the freshmen to bond together and forge friendship

Sub-Committee Member of SPMS Social Committee *Aug 2015 - Aug 2017*

Yishun Junior College

Section Leader in Chinese Orchestra *May 2011 - May 2012*