

Curriculum Vitae

Name: Nattaphong Wonglakhon

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RESEARCH INTERESTS

Quantum measurement, quantum information, and quantum control; quantum theory and quantum optics; stochastic processes and stochastic differential equations.

EDUCATION 2016 - 2020

Bechelor of Science (Physics, Honour program)

Mahidol University, Bangkok, Thailand
CGPA: 3.53 (First Class Honours)

Thesis title : High-precision Numerical Scheme for Quantum Trajectories

Details : Thesis length 11,520 words, undertaken over two semesters full-time of the fourth year. In this thesis, I combined research results produced during my research visit at Centre for Quantum Dynamics, Griffith University, and during the fourth year of my honour program. In broad terms, I proposed a new approach for quantum-trajectory estimations, which is more precise and accurate than previously proposed methods. Moreover, I also made a comparison among all approaches both analytically and numerically, in order to show that my new approach is the most accurate one.

Supervisors : Asst. Prof. Sujin Suwanna, Dr. Areeya Chantasri

RESEARCH EXPERIENCE June 2019 - Current

June 2019 - September 2019

Visiting Student, Griffith University, Centre for Quantum Dynamics, Queensland, Australia

Supervisors : Prof. Howard M. Wiseman and Dr. Areeya Chantasri

Responsibilities: Working on the project titled 'Euler-Milstein numerical scheme for high-precision stochastic process simulation of quantum trajectories'.

My responsibilities included:

- Proving the mathematical equations
- Coding computer programming for the simulations

September 2019 - current

Honour Research program, Mahidol University, Bangkok, Thailand

Supervisors : Asst. Prof. Sujin Suwanna, Dr. Areeya Chantasri and Prof. Howard M. Wiseman (co-advisor)

Responsibilities: Working on the project titled 'High-precision Numerical Scheme for Quantum Trajectories'.

My responsibilities included:

- Devising high-precision measurement maps for quantum measurement
- Coding computer programming for trajectory simulations
- Writing a manuscript for publication

SKILLS

Theories : Quantum open system principles, quantum trajectories estimation techniques, stochastic processes, quantum control techniques

Numerical analysis: Python and Matlab programming

- CONFERENCE PUBLICATION** N. Wonglakhon, S. Suwanna, A. Chantasri, “Euler-Milstein and relevant approaches for high-precision stochastic simulation of quantum trajectories,” To be published in *Journal of Physics: Conference Series* (2020).
Authorship statement: A. Chantasri and H. M. Wiseman helped me on writing the manuscript for publication while I did all simulations throughout the paper.
- CONFERENCE TALK AND POSTER** **Oral presentation**
 1. N. Wonglakhon, S. Suwanna, A. Chantasri, “Approaches for high-precision stochastic simulation of quantum trajectories,” *DPST Online Conference 2020* Online Conference – July 2020
- Poster presentation**
 1. N. Wonglakhon, S. Suwanna, A. Chantasri, “Euler-Milstein Numerical Scheme for High-precision Stochastic Process Simulation of Quantum Trajectories,” *International Workshop for Young Researchers on the Future of Quantum Science and Technology (FQST)* NII, Tokyo, Japan – February 2020
- PAPER IN PREPARATION** N. Wonglakhon, H. M. Wiseman, A. Chantasri, “Completely Positive Maps for High-order Unraveling of Lindblad Master Equations,” In preparation (2020).
- GRANT/ AWARDS**
 1. Royal Government of Thailand Scholarship (Development and Promotion of Science and Technology Talents Project–DPST) for studying in Thailand – 2016
 2. First prize physics senior project presentation at DPST Conference – July 2020
- REFERENCES AVAILABLE TO CONTACT**
 1. **Prof. Howard M. Wiseman**
 (email: h.wiseman@griffith.edu.au; phone: +61 7 3735 7271)
 - Centre for Quantum Dynamics, Griffith University
 - *Prof. Wiseman was my co-supervisor at Griffith University*
 2. **Asst. Prof. Sujin Suwanna**
 (email: sujin.suw@mahidol.ac.th; phone +66 2 201 5733)
 - Optical and Quantum Physics Laboratory, Department of Physics, Faculty of Science, Mahidol University
 - *Asst. Prof. Suwanna was my current supervisor at Mahidol University*
 3. **Dr. Areeya Chantasri**
 (email: areeya.chn@mahidol.ac.th; phone +66 85 840 8605)
 - Optical and Quantum Physics Laboratory, Department of Physics, Faculty of Science, Mahidol University
 - Centre for Quantum Dynamics, Griffith University
 - *Dr. Chantasri was my co-supervisor at Mahidol University*