

# MOHAMED RIDZA WAHIDDIN



- KULLIYAH OF INFORMATION AND COMMUNICATION TECHNOLOGY
- IIUM Gombak Campus
- Email address: [mridza@iium.edu.my](mailto:mridza@iium.edu.my)

## ACADEMIC QUALIFICATION

- Diploma in Islamic Studies
- Doctor of Philosophy in Theoretical Physics
- Masters of Science (Theoretical Physics)
- Bachelor of Science (Physics)

## TEACHING RESPONSIBILITIES

ADVANCED MATHEMATICAL METHODS	2004/2005
CALCULUS II	2011/2012 2012/2013 2013/2014 2014/2015 2015/2016 2016/2017
DEVELOPING AND PROTECTING MATHEMATICAL IDEAS	2003/2004
FINAL YEAR PROJECT	2014/2015 2015/2016
FINAL YEAR PROJECT I	2017/2018
HALAQAH 1 (BROTHERS)	2002/2003
HALAQAH 1 (SISTER)	2003/2004
HALAQAH 2 (BROTHER)	2002/2003
INTELLECTUAL PROPERTY RIGHTS	2002/2003
MATERIALS PHYSICS	2002/2003
MATHEMATICAL METHODS	2003/2004 2004/2005
MATHEMATICS FOR COMPUTING III	2017/2018 2018/2019

## RESEARCH PROJECTS

### In Progress

- 2019 - Present** IIUM Blue Light Hazard App: Transferring Optical Knowledge on the Circadian and Retinal Hazard of Blue Light to the Malaysian Optometrists

- 2019 - Present** The Development of Cybersecurity Awareness Model using CTC ? Chaos Theory of Careers for Secondary Schools.
- 2019 - Present** Autonomous Quantum Thermal Machine for Quantum Steering
- 2019 - Present** A Tripartite Fake News Detection Framework
- 2017 - Present** Quantum theory of a non-degenerate parametric amplifier beyond Rotating Wave Approximation
- 2017 - Present** A New Cost-Effective Low-Hop Distance Hierarchical Interconnection Network for Massively Parallel Computer System
- 2016 - Present** Cybersecurity Capability Maturity Model based on Maqasid al Shari'ah (MS-C2M2)
- 2015 - Present** Secret Key Infusion for Internet of Things
- 2013 - Present** DYNAMICAL SYSTEMS AND THEIR APPLICATIONS (DSTA)
- 2008 - Present** Intelligent Cyberspace Security

### **Completed**

- 2015 - 2017** Secret Key Infusion for Internet of Things
- 2013 - 2013** Analisa dan Kajian Analisa Berhubung Cadangan Pelan Strategik 5 Tahun Kementerian Dalam Negeri (KDN) 2004-2018
- 2012 - 2015** A New Spatial Domain Watermarking Technique Based On Multiple Intermediate Significant Bits
- 2011 - 2013** RU 2011: Block Ciphers: Analysis and Design
- 2011 - 2014** Modeling Illegal Immigrants Behaviour in Malaysia Via Scale Free Network
- 2011 - 2015** Systemic Human Behaviour Security: Deception Detection, Privacy & Secure Communications
- 2009 - 2011** Free-Space Optic (FSO) Links for Quantum Key Distribution (QKD)
- 2009 - 2013** Nonlinear Waves in Bose-Einstein Condensates & Optical Waveguide Systems with Higher Order Nonlinearity
- 2008 - 2011** Realization of Quantum Decoy States for Information Security
- 2007 - 2017** IIUM - MIMOS Cyberspace Security Lab
- 2006 - 2012** Free Space Quantum Key Distribution: Implementation and Security Analysis
- 2006 - 2007** Fuzzy correlation Inequalities for Ferromagnetic System

**Unknown - 2018** Privacy and Security in Cloud First Policy Environment (Microsoft Fund)

**Unknown - 2016** FREE SPACE QUANTUM KEY DISTRIBUTION

## PUBLICATIONS

### Article

- 2020** [Interaction of a three-level atom and a field with a time-varying frequency in the context of triangular well potentials: an exact treatment.](#) Chaos, Solitons & Fractals , 139 pp.1-8
- 2020** [Quantum correlations and quantum fisher information of two qubits in the presence of the time-dependent coupling effect.](#) European Physical Journal Plus , 135 (6)
- 2019** [Nature of complex network of dengue epidemic as a scale-free network.](#) Healthcare Informatics Research , 25 (3) pp.182-192
- 2019** [Generation of elementary gates and Bell's states using controlled adiabatic evolutions.](#) International Journal of Quantum Information , 17 (3) pp.1950020-1
- 2018** [Squeezing, mixed mode squeezing, amplitude squared squeezing and principal squeezing in a non-degenerate parametric oscillator.](#) Optik , 157 pp.1035-1052
- 2018** [A novel secret key generation based on image link.](#) International Journal of Engineering and Technology , 7 (2.5) pp.23-26
- 2018** [Context-aware services based on spatio-temporal zoning and crowdsourcing.](#) Behaviour & Information Technology , 37 (7) pp.736-760
- 2017** [The probe attack on the Bennett-Brassard 1984 protocol in the presences of noisy amplitude damping channel.](#) Springer pp.1-12
- 2017** [Robustness of dengue complex network under targeted versus random attack.](#) Complexity , 2017 pp.1-12
- 2017** [Two-mode network modeling and analysis of dengue epidemic behaviour in Gombak, Malaysia.](#) Applied Mathematical Modelling , 43 pp.207-220
- 2017** [Quantum phase fluctuations of coherent and thermal light coupled to a non-degenerate parametric oscillator beyond rotating wave approximation.](#) Optics Communications , 398 pp.1-11
- 2016** [Building CMU Sphinx language model for the Holy Quran using simplified Arabic phonemes.](#) Egyptian Informatics Journal , 17 (3) pp.305-314
- 2016** [On the quantum phase fluctuations of coherent light coupled to a degenerate parametric amplifier.](#) Optik International Journal for Light and Electron Optics , 127 pp.2988-2991
- 2016** [The importance of building a conscience in business actions.](#) APACCIOOutlook , 2 (1) pp.45-46

- 2016** [Towards using CMU sphinx tools for the Holy Quran recitation verification.](#) International Journal on Islamic Applications in Computer Science And Technology (IJASAT) , 4 (2) pp.10-15
- 2016** [Atomic coupler with two-mode squeezed vacuum state.](#) Malaysian Journal of Mathematical Sciences , 10 pp.103-110
- 2015** [Entropy squeezing for qubit-field system in the presence multi-photon process under decoherence effect.](#) Optical and Quantum Electronics , 47 (2) pp.267-278
- 2015** [Combinatorial interpretation of raney numbers and tree enumerations.](#) Open Journal of Discrete Mathematics , 5 (1) pp.1-9
- 2015** [Analyzing the weighted dark networks using scale-free network approach.](#) WSEAS Transactions on Computers , 14 pp.748-759
- 2015** [Topological structure of complex networks and its importance in diffusion.](#) Sindh University Research Journal (Science Series) , 47 (2) pp.191-194
- 2015** [Entanglement for moving three-level atom under decoherence effect.](#) Journal of Computational and Theoretical Nanoscience , 12 (10) pp.3970-3976
- 2014** [Entropy squeezing for qubit - field system under decoherence effect.](#) Quantum Electronics , 44 (3) pp.274-278
- 2013** [Interaction of two pulses in defocusing nonlinear Schrodinger equation.](#) Journal of Physics: Conference Series , 435 (012034) pp.1-4
- 2013** [Three level atom in bad cavity.](#) Middle-East Journal of Scientific Research , 13 pp.31-37
- 2013** [Computer assisted alerts using mental model approach for customer service improvement.](#) Journal of Software Engineering and Applications , 6 pp.21-25
- 2012** [Tight bounds for the eavesdropping collective attacks on general CV-QKD protocols that involve non-maximally entanglement.](#) Quantum Information Processing , 12 (2) pp.1551-1171
- 2012** [Tightening the eavesdropping accessible information for continuous variable quantum key distribution protocols that involve nonmaximally entanglement.](#) International Journal of Modern Physics B , 26 (16) pp.1-15
- 2012** [Continuous-variable quantum key distribution protocols with eight-state discrete modulation.](#) International Journal of Quantum Information , 10 (1) pp.1-15
- 2012** [Phase coherent states for enhancing the performance of continuous variable quantum key distribution.](#) Journal of the Physical Society of Japan , 81 pp.1-9
- 2010** [Quantum properties of the three-mode squeezed operator: triply concurrent parametric amplifiers.](#) Optics Communications , 283 (16) pp.3158-3167
- 2010** [Protocol of secure key distribution using hash functions and quantum authenticated channels key distribution process six-state quantum protocol.](#) Journal of Computer Science , 6 (10) pp.1094-1100
- 2010** [Improvement of secure communication with continuous variable entanglement of squeezed coherent states via heterodyne detection.](#) Journal of Physics B : Atomic, Molecular and Optical Physics , 43 pp.1-6

- 2010** [A protocol for secret key infusion from satellite transmissions](#). International Journal of Computer and Network Security (IJCNS) , 2 (7) pp.99-101
- 2010** [Protocol of secure key distribution using Hash Functions and Quantum Authenticated channels \(KDP-6DP\)](#). Journal of Computer Science , 6 (10) pp.1123-1129
- 2010** [Fiber and free-space practical decoy state QKD for both BB84 and SARG04 protocols](#). The European Physical Journal D
- 2010** [A linear atomic quantum coupler](#). Journal of Physics B : Atomic, Molecular and Optical Physics , 43 pp.1-9
- 2009** [Quantum key distribution in terms of the Greenberger-Horne-Zeilinger state: multi-key generation](#). Laser Physics (International Journal) , 20 (5) pp.1-21
- 2009** [New estimates of single photon parameters for satellite-based QKD](#). Optics Communications , 282 (15) pp.3185-3189
- 2009** [Quantum state engineering with ququarts: application for deterministic QKD protocol](#). EPL (Europhysics Letters) , 87 pp.10008-p1
- 2009** [Quantum key distribution using decoy state protocol](#). American Journal of Engineering and Applied Sciences , 2 (4) pp.694-698
- 2009** [Decoy state quantum key distribution](#). IIUM Engineering Journal , 10 (2) pp.81-86
- 2009** [Implementation of decoy state protocol](#). European Journal of Scientific Research , 33 (1) pp.183-186
- 2008** [Blind encoding into qudits](#). Physics Letters A , 372 (12) pp.1963-1967
- 2008** [Transient entropy squeezing of a single-Cooper-pair box placed inside a phase-damped cavity](#). Optics Communications , 281 (24) pp.6019-6023
- 2008** [Single-atom entropy squeezing for two two-level atoms interacting with a single-mode radiation field](#). Optics Communications , 281 (10) pp.2854-2863
- 2007** [Nonentangled qutrits in two way deterministic QKD](#). Physics Letters A , 361 (6) pp.445-449
- 2007** [Anticloning Gaussian attack for continuous variable EPR correlations](#). Journal of Physics B: Atomic, Molecular and Optical Physics , 40 (6) pp.1153-1160
- 2006** [Deterministic six states protocol for quantum communication](#). Physics Letters A , 358 (2) pp.85-90
- 2006** [Generation of three-qubit entangled W-state by nonlinear optical state truncation](#). Journal of Physics B : Atomic, Molecular and Optical Physics , 39 (6) pp.1269-1274
- 2005** [Coupled-mode theory for Bose-Einstein condensates with time dependent atomic scattering length](#). Physics Letters A , 345 (1-3) pp.237-244
- 2004** [The effect of finite bandwidth squeezed light on entanglement creation in the Dicke model](#). Journal of Optics B: Quantum and Semiclassical Optics , 6 (7) pp.289-295

- 2004 [An Ising model with three competing interactions on a Cayley tree.](#) Journal of Mathematical Physics , 45 (9) pp.3645-3658
- 2003 [Exact solution of an Ising model with competing interactions on a Cayley tree.](#) Journal of Physics A: Mathematical and General , 36 (15) pp.4283-4289
- 2003 [Quantum-trajectory simulations of a two-level atom cascaded to a cavity QED laser.](#) Physical Review A - Atomic, Molecular, and Optical Physics , 68 (6) pp.063804/1-063804/6
- 2003 [Spin squeezing as a measure of entanglement in a two-qubit system.](#) Physical Review A - Atomic, Molecular, and Optical Physics , 68 (6) pp.064301/1-064301/4
- 1998 [Quantum trajectory theory for a two-level atom in a squeezed vacuum field with non-radiative dephasing.](#) Journal of Modern Optics , 45 (10) pp.2105-2115

#### Conference or Workshop Item

- 2019 [Investigation of adoption behaviour for social commerce in the Kingdom of Saudi Arabia.](#) In: **5th IEEE International Conference on Engineering Technologies and Applied Sciences (ICETAS) 2018**
- 2018 [Constructing a knowledge base for Al-Qur'an utilizing principles of human communication.](#) In: **4th International Conference on Information Retrieval and Knowledge Management (CAMP)**
- 2018 [Cyber security maturity model and Maqasid al-Shari'ah.](#) In: **2018 International Conference on Information and Communication Technology for the Muslim World (ICT4M)**
- 2018 [Rule based modeling of knowledge bases: rule based construction of knowledge base models for automation/expert systems.](#) In: **2017 International Conference on Computational Science and Computational Intelligence (CSCI 2017)**
- 2018 [Towards an accurate speaker-independent Holy Quran acoustic model.](#) In: **4th IEEE International Conference on Engineering Technologies and Applied Sciences, ICETAS 2017**
- 2017 [Quality of polarization entanglement in spontaneous parametric down conversion.](#) In: **International Conference on Applied Photonics and Electronics 2017 (InCAPE2017)**
- 2017 [Testing Sphinx's language model fault-tolerance for the Holy Quran.](#) In: **6th International Conference on Information and Communication Technology for the Muslim World (ICT4M 2016)**
- 2017 [Message from Deputy Rector \(Research & Innovation\).](#) In: **6th International Conference on Information and Communication Technology for the Muslim World, ICT4M 2016**
- 2016 [Logico-linguistic semantic representation of documents.](#) In: **2nd International Conference on Big Data Intelligence and Computing (DataCom 2016)**
- 2016 [Intellectual assets and knowledge audit as a fundamental step for the "University of the Future" transformation.](#) In: **4th IEEE International Colloquium on Information Science and Technology (CiSt)**

- 2016 [Multi-layered alert filtration and feedback cycle using Brahms model.](#) In: 2015 4th International Conference on Advanced Computer Science Applications and Technologies (ACSAT 2015)
- 2016 [Scale free network analysis of a large crowd through their spatio-temporal activities.](#) In: 2015 4th International Conference on Advanced Computer Science Applications and Technologies (ACSAT 2015)
- 2016 [Atomic coupler with two-mode squeezed vacuum states.](#) In: 3rd International Conference on Mathematical Applications in Engineering (ICMAE'14)
- 2016 [Cultivating the Communities of Practice in the Academia.](#) In: KCONNECT 2016
- 2015 [A cybersecurity capability maturity model based on Maqasid Shari'ah\(MS-C2M2\).](#) In: International Conference on Maqasid Al-Shari'ah in Public Policy and Governance
- 2015 [Towards using CMU Sphinx Tools for the Holy Quran recitation verification.](#) In: 3rd International Conference on Islamic Applications in Computer Science and Technologies (IMAN 2015)
- 2015 [i-Diary: A crowdsorce-based spatio-Temporal multimedia enhanced points of interest authoring tool.](#) In: 2015 ACM Multimedia Conference
- 2015 [Visualization of a scale free network in a smartphone-based multimedia big data environment.](#) In: The First IEEE International Conference on Multimedia Big Data : BigMM 2015
- 2014 [Node status detection and information diffusion in router network using scale-free network.](#) In: 10th International Network Conference, INC 2014
- 2014 [Calculus and its applications in scale-free networks .](#) In: 5th International Conference on Information and Communication Technology for The Muslims World (ICT4M 2014)
- 2014 [Towards a mobile and context-aware framework from crowdsourced data.](#) In: 2014 The 5th International Conference on Information and Communication Technology for The Muslim World (ICT4M)
- 2014 [Two-mode complex network modeling of dengue epidemic in Selangor, Malaysia.](#) In: 2014 The 5th International Conference on Information and Communication Technology for The Muslim World (ICT4M)
- 2013 [Generalized quantum rotation gates using STIRAP .](#) In: The 4th International Conference on Information & Communication Technology for the Muslim World (ICT4M)
- 2012 [Interaction of two pulses in defocusing Nonlinear Schrödinger equation.](#) In: International Conference of Application Science & Technology (iCAST2012)
- 2010 [A secure protocol using 6DP for Quantum Authentication and Hash Functions for Key Distribution \(KDP-6DP\).](#) In: International Conference on Computer and Communication Engineering, ICCCE 2010

#### Book

- 2019 [Kampung Malays: surviving modernity.](#) IIUM Press, International Islamic University Malaysia . ISBN 978-967-491-014-3

**2014** [Quantum optics for beginners.](#) Pan Stanford Publishing Pte. Ltd. . ISBN 9789814411752

**Book Section**

**2016** [A new quantum theory in accordance with Islamic science.](#) In: **Islamic perspectives on science and technology: selected conference papers** Springer Singapore . ISBN 978-981-287-777-2 , pp.237-255

**2013** [Strategic planning: steering the ship through changing circumstances.](#) In: **IUM: The Premier Global Islamic University** IUM Press . ISBN 9789674182700 , pp.63-77

**2012** [Reasoning of collaborative human behaviour in security-critical work practices: a framework.](#) In: **Trustworthy Ubiquitous Computing** Atlantis Press . ISBN 978-94-91216-70-1 (Print) 978-94-91216-71-8 (Online) , pp.99-106

**2011** [The decoy state method in quantum key distribution.](#) In: **Selected topics in advanced electronics** IUM Press . ISBN 9789674181536 , pp.97-119