

Personal Information

First Name: MONAMORN
Last Name: PRECHARATTANA
Date of Birth: June 04, 1984
Place of Birth: Bangkok, Thailand
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Research Interests

Cellular automaton in biological and agricultural systems
STEM Education/ Ubiquitous Learning / Physics education

Education

| | |
|------------------------|---|
| 2007-2011 | Mahidol University, Thailand |
| <i>Degree:</i> | Ph.D. (Physics), (GPA 3.73) |
| <i>Dissertation:</i> | A Biophysical Cellular Automata Model of CD4 ⁺ T Cell Dynamics in HIV/AIDS Infection: Stochastic Approach |
| <i>Advisor:</i> | Assoc. Prof. Wannapong Triampo, Ph.D. |
| <i>Grant:</i> | The Strategic Scholarships for Frontier Research Network, for Ph.D. Program, Commission on Higher Education (CHE), Thailand |
| 2006-2007 | Kasetsart University, Thailand |
| <i>Degree:</i> | Grad.Dip. (Teaching Science Profession), (GPA 3.85) |
| <i>Senior project:</i> | Enhancing of Achievement in Physics for the Mattayom 4 Students through a Mastery of Learning |
| <i>Advisor:</i> | Asst. Prof. Narumol Yutakhom, Ph.D. Pongprapan Pongsophon, Ph.D. |
| <i>Grant:</i> | The Project for Promotion of Science and Mathematics Teacher, Institute for the Promotion of Teaching Science and Technology (IPST), Thailand |
| 2002-2006 | Kasetsart University, Thailand |
| <i>Degree:</i> | B.Sc. with 2 nd class honors (Physics), (GPA 3.38) |
| <i>Senior project:</i> | Probability of Finding Strange Quarks in Stars, or Strange Stars |
| <i>Advisor:</i> | Maneenate Wechakama, M.Sc. |
| <i>Grant:</i> | The Project for Promotion of Science and Mathematics Teacher, Institute for the Promotion of Teaching Science and Technology (IPST), Thailand |

Academic Position

2011-Present Lecturer of Institute for Innovative Learning, Mahidol University, Thailand

Research Projects

2019-2024 Innovative of Rice Varieties and Production Technologies to Support Modern Agriculture
Grant: Government Budget Research Grant (2020). National Research Council of Thailand, Thailand

- 2019-Present A Context-Awareness Ubiquitous Learning Driven by Reasoning-Based Learning Cycle to Enhance Students' Scientific Conceptual Achievement, Reasoning, Argumentation, and Environment Awareness: Rice Field Environment.
Grant: -None-
- 2016-Present Development of stochastic cellular automata for investigation of rice's growth rate and yield prediction in system of rice intensification for Khao Dawk Mali 105 rice line
Grant: Government Budget Research Grant (2017-2018). National Research Council of Thailand, Thailand
- 2016-2018 Development of Learning Innovation Based on STEM Education for Promoting Learning Skills in Physics for 21st Century Learners
Grant: (2016-2018) Thailand Center of Excellence in Physics, Thailand
- 2011-Present Medical modeling and simulation to develop a stochastic cellular automaton model: effects of cell-mediated immunity to eradicate HIV-1 infection
Grant: TRF-CHE Research Grant for New Scholar (2016). The Thailand Research Fund, Thailand
- 2012-2016 Cellular automata based game for enhancing logical thinking
Grant: Research Assistantships (2013). Mahidol University, Thailand
- 2013-2014 Development of inquiry-based computer instruction package of immune system
Grant: Young Researcher Grant Program (2014). Mahidol University, Thailand

Academic Projects

- 2019 The Connecting the Mekhong through Education and Training (USAID-LMI COMET)
- 2018 TEDxMahidolU 2 (Head of Finance and Accounting)
- 2017 Drama Program in health promotion for Mahidol University Students and Staff
Grant: Thai Health Promotion Foundation, Thailand
- 2017 SPOC and MOOC Development Project (Academic Year 2017)
"Measurement and Evaluation in Education (Teachers and Researchers Edition)" course
Grant: Office of the Higher Education Commission: OHEC, Thailand
- 2017 TEDxMahidolU (Head of Information Technology and Production)
- 2017 Enjoy Science Project by Chevron Thailand

Professional Experiences by

○ Career works

- 2011-Present Lecturer, Institute for Innovative Learning, Mahidol University, Thailand
- 2015-Present Senate Committee, Mahidol University, Thailand
- 2014-2016 Writer at Aksorn chaloan tat, Bangkok, Thailand
- 2014-2015 Invited Instructor, Rajinibon School, Bangkok, Thailand
- 2013 Special Lecturer, College of Industrial Technology, King Mongkut's University of Technology North Bangkok, Thailand

- Subjects/ Courses
 - Physics for high school students
 - Physics for pre-engineering students
 - Physics Education
 - Research in Science and Technology Education
 - Analysis of Research in Teaching Science
 - Innovations in Science and Technology Education
 - Problem-Based Learning and Project-Based Learning
 - Measurement and Evaluation in Education
 - Seminars in Science and Technology Education
 - How to Write Teaching Plan
 - How to Manage Class for the Effective Learning Process
 - How to Write Academic Paper

- Thesis / Dissertations Advising
 - Chulaluk Yimdee.** A Context-Awareness Ubiquitous Learning Driven by Reasoning-Based Learning Cycle to Enhance Students' Scientific Conceptual Achievement, Reasoning, Argumentation, and Environment Awareness: Rice Field Environment. Doctor of Philosophy (Science and Technology Education)
 - Dumcho Wangdi.** Development of a Guided Inquiry Laboratory to Enhance Students' Understanding of Law of Energy Conservation. Master of Science (Science and Technology Education)
 - Apinya Dhatsuwan.** Game-based Cellular Automata to Enhance Logical Thinking. Doctor of Philosophy (Science and Technology Education)
 - Sonam Choegyai.** Development of a Science Learning Unit to Enhance High School Students' Understanding of Rainbow Based on Predict-Observe-Explain Approach. Master of Science (Science and Technology Education)

- Research Fellowships
 - 2015 Visiting scientist at Biophysics group, School of Physics and Mechanical & Electrical Engineering, Xiamen University, China
 - 2013 Visiting scientist at Faculté de Médecine et de Pharmacie de Grenoble - Université Joseph Fourier (UJF), France

- Books writer
 - 2015-2016 Physics Text Books 1 and 2 (Based core curriculum 2551, Level: High school, Publisher: Aksorn chaloan tat)
 - Physics Exercise Books 3 (Based core curriculum 2551, Level: High school, Publisher: Aksorn chaloan tat)

Publication Statistics

Journal Articles: 12

Conference Papers: 6

Citations: Google scholar: 48 with h-index of 4

Scopus: 23 (excluding self-citations) with h-index of 4

Publications

- International journals
- 2018 Kitrungloadjanaporn P, Phothong A, and **Precharattana M***. Seesaw Balancing: a Hands-on Model to Understand Moment of Force in Classroom, *Applied Mechanics and Materials* 2018; 879: 269-275.
- Kajonphol T*, Tonwong S, Nonthakod S, Sangsiri C and **Precharattana M**. Effect of Spacing and No. of Seedling per Hill on Growth and Yield Components of Rice cv. Chai Nat 1 under System of Rice Intensification , *Applied Mechanics and Materials* 2018; 879: 95-100.
- Kajonphol T, Seetaput N, **Precharattana M**, and Sangsiri C*. Correlation and Multiple Regression Model for Economic Traits of Local Rice (*Oryza Sativa* L.) in Upland Rice System, *Applied Mechanics and Materials* 2018; 879: 71-77.
- Choegyul S and **Precharattana M***. Indoor Rainbow Model: an Apparatus for Observing Spectrum in Classroom, *Applied Mechanics and Materials* 2018; 879: 260-266.
- Precharattana M**. Development of Computer-assisted Instruction Lesson on Immune System Organs and Immune System Diseases, *Applied Mechanics and Materials* 2018; 87: 276-283.
- 2017 Wangdi D, Kanthang P and **Precharattana M***. Development of a hands-on model embedded with guided inquiry laboratory to enhance students' understanding of law of mechanical energy conservation, *Asia-Pacific Forum on Science Learning and Teaching* 2017; 18(2).
- 2016 Dhatsuwan A* and **Precharattana M**. BLOCKYLAND: Cellular Automata Based Game to Enhance Logical Thinking, *Simulation and Gaming* 2016; 47(4): 445-464. DOI: 10.1177/1046878116643468.
- 2015 **Precharattana M**. Stochastic Modeling for Dynamics of HIV-1 Infection Using Cellular Automata: a Review, *Journal of Bioinformatics and Computational Biology* 2015;14(1):1-17. DOI:10.1142/S021972001630001X.
- 2014 **Precharattana M*** and Triampo W. Modeling Dynamics of HIV Infected Cells Using Stochastic Cellular Automaton, *Physica A: Statistical Mechanics and its Applications* 2014;407:303-311.
- 2011 **Precharattana M**, Triampo W*, Modchang C, Triampo D, Lenbury Y, Nokkaew A. Stochastic Cellular Automata Model and Monte Carlo Simulations of CD4⁺ T Cell Dynamics with a Proposed Alternative Leukapheresis Treatment for HIV/AIDS, *Computer in biology and medicine* 2011;41(7):546-558.
- Sudprasert K, **Precharattana M**, Nuttavut N, Triampo D, Pattanasiri B, Lenbury Y and Triampo W*. Non-equilibrium Statistical Mechanics of Driven Lattice Gas Model: Probability Function, FDT-violation, and Monte Carlo Simulations, *International Journal of Computational and Mathematical Sciences* 2011;5(2):84-92.

- 2010 **Precharattana M**, Triampo W, Modchang C, Triampo D, Lenbury Y*. Investigation of Spatial Pattern Formation Involving CD4⁺ T cells in HIV/AIDS Dynamics by a Stochastic Cellular Automata Model, International Journal of Mathematics and Computer in Simulations 2010;4(4):135-143.
- Book Chapter

2012 **Precharattana M** and Triampo W. Effects of Initial Concentration and Severity of Infected Cells on Stochastic Cellular Automaton Model Dynamics for HIV Infection. G.C. Sirakoulis and S. Bandini (Eds.): ACRI 2012, LNCS 7495, pp. 454–463, 2012. © Springer-Verlag Berlin Heidelberg 2012.
 - Proceedings

2018 **Precharattana M**, Kajonphol T. A stochastic cellular automata model for rice tillering in the system of rice intensification. In Journal of Physics: Conference Series 2018 Jul (Vol. 1053, No. 1, p. 012104). IOP Publishing.

2014 Wangdi D, Kanthang P and **Precharattana M**. A Low Cost Hands-on Model for Demonstration on Law of Mechanical Energy Conservation, Proceeding of the 40th Congress on Science and Technology of Thailand, December 2-4, 2014; Khon Kaen, Thailand.

Choegyul S and **Precharattana M**. Development of a Learning Unit to Enhance High School Students' Understanding about Spectrum Formation in Rain Drop Using Predict-Observe-Explain (Poe) Learning Cycle, Proceeding of the 2nd ASEAN Plus Three Graduate Research Congress, February 5-7, 2014; Bangkok, Thailand.

2012 **Precharattana M** and Triampo W. Stochastic Cellular Automata for HIV Infection with Effects of Cell-mediated Immunity, Proceeding of the 2012 International Conference on Scientific Computing (CSC'12), July 16-19, 2012; Las Vegas, USA.

2010 **Precharattana M**, Triampo W, Modchang C, Triampo D, Lenbury Y. Simulation of a Stochastic Cellular Automata HIV/AIDS Model for Investigation of Spatial Pattern Formation Mediated by CD4⁺ T Cells and HIV Dynamics, Proceeding of the 10th WSEAS International Conference on Applied Computer Science (ACS'10), October 4-6, 2010; Iwate Prefectural University, Japan.
 - Conference presentations

Kitrungloadjanaporn P, Phothong A, and **Precharattana M**. Seesaw Balancing: a Hands-on Model to Understand Moment of Force in Classroom. The 8th RMUTP International Conference on Science, Technology and Innovation for Sustainable Development: Challenges towards the Digital Society, June 22-23, 2017; Pullman Bangkok King Power, Bangkok, Thailand

Tonwong S, Nonthakod S, Kajonphol T, Sangsiri C and **Precharattana M**. Effect of Spacing and No. of Seedling per Hill on Growth and Yield Components of Rice cv. Chai Nat 1 under System of Rice Intensification. The 8th RMUTP International Conference on Science, Technology and Innovation for Sustainable Development: Challenges towards the Digital Society, June 22-23, 2017; Pullman Bangkok King Power, Bangkok, Thailand

Kajonphol T, Seetaput N, **Precharattana M**, and Sangsiri C. Correlation and Multiple Regression Model for Economic Traits of Local Rice (*Oryza Sativa L.*) in Upland Rice System. The 8th RMUTP International Conference on Science, Technology and Innovation for Sustainable Development: Challenges towards the Digital Society, June 22-23, 2017; Pullman Bangkok King Power, Bangkok, Thailand

Choegyul S and **Precharattana M**. Indoor Rainbow Model: an Apparatus for Observing Spectrum in Classroom. The 8th RMUTP International Conference on Science, Technology and Innovation for Sustainable Development: Challenges towards the Digital Society, June 22-23, 2017; Pullman Bangkok King Power, Bangkok, Thailand

Precharattana M. Development of Computer-assisted Instruction Lesson on Immune System Organs and Immune System Diseases. The 8th RMUTP International Conference on Science, Technology and Innovation for Sustainable Development: Challenges towards the Digital Society, June 22-23, 2017; Pullman Bangkok King Power, Bangkok, Thailand

Dhatsuwan A and **Precharattana M**. Learning of Cellular Automata Using Paper-Based Game: Pilot Study. The 2nd ASEAN Plus Three Graduate Research Congress (2AGRC), February 5-7, 2014; Bangkok, Thailand.

Precharattana M and Triampo W. Stochastic Cellular Automaton Model for Dynamics of HIV Infection. International Conference in Mathematics and Applications (ICMA-MU 2013), January 19-21, 2013, Bangkok, Thailand.

Precharattana M. Exploring the Students' Demand on Media Used in Immune System Teaching. The 1st International Conference on Innovation in Education (ICIE 2012), November 7-9, 2012, Bangkok, Thailand.

Precharattana M and Triampo W. Effects of Initial Concentration and Severity of Infected Cells on Stochastic Cellular Automaton Model Dynamics for HIV Infection. The 10th edition of ACRI 2012 Conference (Cellular Automata for Research and Industry), September 24-27, 2012, Santorini, Hellenic Republic.

Precharattana M, Nokkeaw A, Triampo W, Triampo D and Lenbury Y. How could Leukocytapheresis as an Alternative HIV/AIDS Treatment Save Life?: Stochastic Model and Simulations. The 18th International Conference on the Discrete Simulation of Fluid Dynamics (DSFD 2009), July 6-10, 2009, Peking University, Beijing, People's Republic of China.

Precharattana M, Nokkeaw A, Triampo W, Triampo D, Lenbury Y, "The Quest for a Strategy to Survive with HIV/AIDS, How could Leukocytapheresis as an Alternative HIV/AIDS Treatment Save Life?" , Physic for dynamics society (SPC 2009), March 19-21, 2009, Petchaburi , Thailand.

Precharattana M, Wechakama M. Neutron Star. Science and Technology for Youth, Bangkok International Trade & Exhibition Centre (BITEC), March 14-15, 2006, Bangkok, Thailand.

Innovations/ Products

- 2016 BLOCKYLAND: Cellular automaton educational game for enhancing logical thinking Cellular automaton educational game for enhancing logical thinking
- 2015 Law of Energy Conservation instructional tool for a guided inquiry laboratory (petty patent)
- 2014 Indoor Rainbow model: an apparatus for studying rainbow formation
- 2014 Seesaw Balancing: a simple apparatus for studying moment of force
- 2013 Inquiry-based computer instruction package of immune system

Academic Services

- Journals Reviewer

- Frontiers Immunology (IF = 6.429)
 - PLOS ONE (IF = 3.057)
 - PHYSICA A (IF = 1.785)
 - Asia-Pacific Forum on Science Learning and Teaching (IF=0.161)

- Books Reviewer

- 2019 PHYSICS BOOK 1-6 (Based core curriculum 2561, Level: High school, Publisher: AIMPHAN)
 - SCIENCE BOOK 1-6 (Based core curriculum 2561, Level: Primary school, Publisher: KURU media)
 - 2018-2019 COMPUTATIONAL THINKING 1-6 (Based core curriculum 2561 by STEM based Education technique, Level: Primary school, Publisher: EDUKIDS)
 - 2016-2017 SCIENCE BOOK 1-6 (Based core curriculum 2551 by STEM based Education technique, Level: Primary school, Publisher: EDUKIDS)

- Teaching

- 2014-2019 Invited Instructor, Horwang School, Bangkok, Thailand

- Selected Workshops

- For university lecturers*

- a. Writing Research Proposal
 - Customer in 2016 Rajamangala University of Technology Rattanakosin

- b. Writing Research Proposal in Education
 - Customer in 2016 Innovative Learning Center, Srinakharinwirot University

- c. STEM Education
 - Customer in 2015 Rajamangala University of Technology Rattanakosin

- For high school teachers*

- d. Enjoy Science Project by Chevron Thailand
 - Customer in 2016 Office of Nakhon Pathom Educational Service Area

- e. Development of PISA test for high school students' assessment and evaluation
Customer in 2014 Office of Rayong Primary Educational Service Area
- f. Development of learning multimedia
Customer in 2013 Office of Samutsakorn Educational Service Area

For students

- g. Fast & Furious
Customer in 2018 Joseph Upatham School
- h. Free Falling
Customer in 2017 Surasak Montri School
- i. Moment of force: Clay Tower
Customer in 2017 Benchama Maharat School
Satreesethabuthbumpen School
- j. Inquiry Labs for Physics
Customer in 2016 Surasak Montri School
- k. Science in the park (one day camp)
Customer in 2016 Surasak Montri School
- l. Moment of force: Clay Tower
Customer in 2016 Benchama Maharat School
Satriwitthaya 2 School
Suankularb Wittayalai Nonthaburi School
Chiang Rai Municipality School 6
2015 Benchama Maharat School
Chiang Rai Municipality School 6
2014 Benchama Maharat School
2013 Mahidol University International Demonstration School
- m. Critical Thinking: Fact and Opinion
Customer in 2013 Suksanari School
- n. How can you keep a falling egg without breaking?
Customer in 2013 Suksanari School
2012 Satrivitthaya 2 School
- o. Roller Coaster: Fun Science with Local problems
Customer in 2012 Samut Sakhon primary students, Te Pang Korn Ratsameechod Camp
- p. Prove it!! Sink or Float
Customer in 2012 Satrivitthaya 2 School
National Science and Technology Fair 2012
2011 Chiangrai Municipality School 6
Benchama Maharat School
Satrivitthaya 2 School

o Seminars

- q. A Farmer Trainee: organic rice farming experiences to researches
2017 Institute of Nutrition, Mahidol University
- r. Highlight section

- 2017 The Third Scholarship of Teaching and Learning: Transformation towards University 4.0. Institute of learning and teaching innovation, Khon Kaen University
- s. Food Crisis, Consumption Crisis
- 2017 Department of Environmental Quality Promotion, Ministry of Natural Resource and Environment
- t. Ignite idea with sharing farming and SRI - research experiences in Thailand.
- 2016 ECHO Thailand
Royal Irrigation. Department Ministry of Agriculture and Cooperatives
- o Others
- u. Physics exam for high school students' competition in "Toyota Mahasarakam_Excellent Award: TMEA"
- Costumer in 2014 Office of Mahasarakarm secondary educational service area, Thailand