

## Personal Information

First Name: MONAMORN  
Last Name: PRECHARATTANA  
Date of Birth: June 04, 1984  
Place of Birth: Bangkok, Thailand  
Nationality: Thai  
Telephone: +6686-526-4623  
Email: monamorn.pre@mahidol.edu



## Research Interests

Modeling and Simulation both in Science and Technology Education among the areas of Physics, Medical system, Agricultural system  
Online learning / Blended learning  
Design and Technology / STEM & Coding Education  
360 Degree Virtual Tour

## 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 <sup>+</sup> 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 <sup>nd</sup> 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 Assistant Professor at Institute for Innovative Learning, Mahidol University, Thailand

## Awards

- 2022 Innovation Project Proposal Writing Award, Good Level. Competition Category: Artificial Intelligence Technology and Equipment Development. Thailand Research Expo 2022 by National Research Council of Thailand.  
Innovation Award for Graduate Studies, Good Level. Competition Category: Artificial Intelligence Technology and Equipment Development. Thailand Research Expo 2022 by National Research Council of Thailand.  
Innovation Award, Gold Medal Level. Competition Category: Artificial Intelligence Technology and Equipment Development. Thailand Research Expo 2022 by National Research Council of Thailand.

## Research Projects

- 2023 Wireless Sensor-based Newborn Intramuscular Injection Training Manikin  
Grant: I-2B (2023). National research council of Thailand, Thailand
- 2022-203 Develop STEM toys to enhance 21<sup>st</sup> century in coding skills  
Grant: Pre-seed. Institute for Technology and Innovation Management (iNT Mahidol), Mahidol University, Thailand
- 2021-2023 Development of learning modules to prepare Thai teachers for artificial intelligence technology era  
Grant: Fundamental Fund (FF) (2 0 2 1-2023). Thai Science Research and Innovation (TSRI), Thailand
- 2019-2023 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-
- 2016-2020 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
- 2011-2018 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

- 2021-Present STEM&Robotics Camp
- 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
  - 2019-Present Editor, Kurumediapress, Bangkok, Thailand
  - 2015-2019 Senate Committee, Mahidol University, Thailand
  - 2014-2016 Writer, 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
  - Teaching Professional Ethics
  - Design Thinking
  - 360 Degree Virtual Tour
  - Simulation
- 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: 16

Conference Papers: 6

Citations: Google scholar: 104 with h-index of 5

## Publications

○ International journals

2023 Tantacharoenrat, C., and **Precharattana, M\***. An Electronic-based Simulator for Intramuscular Injection in Newborns. International Journal of Nursing Education. 2023; 15(2): 1-6.

2023 **Precharattana M\***, Sanium S, Pongsanon K, Ritthipravat P, Chuechote S, and Kusakunniran W. Blended Engineering Design Process Learning Activities for Secondary School Students during COVID-19 Epidemic: Students' Learning Activities and Perception. Education Sciences. 2023; 13(2): 159.

2022 Htet Aung Z, Sanium S, Songsaksupachok C, Kusakunniran W, **Precharattana M**, Chuechote S, Pongsanon K, and Ritthipravat P\*. Designing A Novel Teaching Platform For AI: A Case Study in Thai School Context. Journal of Computer Assisted Learning. 2022; 38(6): 1714-1729.

2020 Wangdi D, **Precharattana M\***, Kanthang P. A Guided Inquiry laboratory to enhance students' understanding of the Law of Mechanical Energy Conservation. International Journal of Innovation in Science and Mathematics Education. 2020 Aug 28;28(1).

2018 Kitrunloadjanaporn 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<sup>+</sup> 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<sup>+</sup> 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 40<sup>th</sup> 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 2<sup>nd</sup> 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<sup>+</sup> 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 2<sup>nd</sup> 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 10<sup>th</sup> 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 18<sup>th</sup> 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?" , Physics 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.

## Products

2022	An Electronic-based Simulator for Intramuscular Injection for Newborns
2021	Law of Energy Conservation instructional tool for a guided inquiry laboratory (petty patent No. 18158)
2016	BLOCKYLAND: Cellular automaton educational game for enhancing logical thinking Cellular automaton educational game for enhancing logical thinking
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)

- 2018-2019 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
    - 2021 Invited Instructor, Roong-Aroon School, Bangkok, Thailand
    - 2014-2019 Invited Instructor, Horwang School, Bangkok, Thailand