## 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.ac.th

## Research Interests

Technology-enhanced learning, such as gaming and simulation, virtual reality (VR) and 360 Degree VDO, ubliquitous learning and Flipped classroom, Personalized Learning, and Hands-on Lab, is applied in both scientific and non-scientific fields. This includes physics education, engineering education, nursing education, general science, agricultural systems, marketing, design thinking, computational thinking, STEM, and coding.

## Education

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

2025 > International Innovation Award, Gold Award. “Wireless Sensor-based Newborn Intramuscular Injection Training Manikin” award by WorldInvent Singapore 2025 (WoSG)

> National Research Award: Inventor Award 2025 “STEM Learning Kit for creating and learning aerodynamic principles with an embedded system that can identify coordinates” award by the National Research Council of Thailand.

2023 > Mahidol Science Innovative Educator Award 2023 by Science Faculty, Mahidol University.

> MU SDGs Award 2023. Honorable Mention by Environment and Sustainable Development Department, Mahidol University.

> First prize for excellence in teaching and learning management strategies applied to coding by College of Lifelong Education, Chiang Mai University.

2022 > Innovation Project Proposal Writing Award, Good Level. Competition Category: Artificial Intelligence Technology and Equipment Development. Thailand Research Expo 2022 by the 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 the National Research Council of Thailand.

> Innovation Award, Gold Medal Level. Competition Category: Artificial Intelligence Technology and Equipment Development. Thailand Research Expo 2022 by the National Research Council of Thailand.

## Research Funding

Principle Investigator

2023-2025 Development of STEM activities at the upper primary level for schools around Bangchak Oil Refinery, Bangchak Corporation Public Company Limited.
Grant: Bangchak Corporation Public Company Limited

2023 Wireless Sensor-based Newborn Intramuscular Injection Training Manikin
Grant: I-2B (2023). National research council of Thailand, Thailand

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

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

Co-Researcher

2024 STEM and Coding Skills Incubation Program for the Sustainable Development of Young People and Workforce Capacity
Grant: Strategic Fund (SF)

2023 The guideline on the use of smart farming for improving agricultural productivity: a case study of community enterprise and young smart farmer, Nakhon Pathom Province
Grant: Strategic Fund (SF)

2022-2023 Develop STEM toys to enhance 21st 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

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

## 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
Simulation for learning
Gamification and Game-based Learning
Spherical video-based virtual reality (SVVR) for learning
Mobile Learning and Context-Aware Ubiquitous Learning (CAUL)
Personalized learning

- Thesis / Dissertations Advising

**Sandhya Ponnayyan Saroja.** Enhancing Learning Performance of Undergraduate Students in Gauss' Law Through a Gamified VR-based POEDE Personalizing System (Science and Technology Education)

**Chinapat Mongkholsiriwattana.** Personalized Flipped STEM-Based Gear Camp for Enhancing Understanding, Self-Regulated Learning, Metacognitive skills, and Engagement in High School Students (Science and Technology Education)

**Bahareh Taghizadeh Kamalabadi.** Integrating Unplugged and Plugged Coding Activities Driven by Self-Questioning Strategies for Enhancing Computational Thinking Skills, Metacognition and Knowledge of Solid Waste Management (SDG11) in Elementary Students (Science and Technology Education)

**Xintong Hua.** Effects Of 5e Game-Based VR on Enhancing International Business Undergraduates' Cross-Cultural Marketing Strategies, Learning Performance, Affection, and 21st Century Skills (Science and Technology Education)

**Chanita Tantacharoenrat.** A Blended Learning Package on Newborn Intramuscular Injection. Doctor of Philosophy (Science and Technology Education)

**Chulaluk Yimdee.** A Context-Aware Ubiquitous Learning Driven by Reasoning-Based Learning Cycle to Enhance Students' Scientific Conceptual Understanding, 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 Choegyal.** 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

2025 Host Supervisor for Visiting Scholar Program. Dr. Yang WeiZhi, School of Physics and Electronic Engineering, Jiaying University. The

People's Republic of China (PRC). Research Program "Collaborative Development of a Digital-Intelligent STEM Teacher Training Framework Integrating Robotics, Programming, and Emerging Technologies for China and Thailand"

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: 19
Conference Papers: 6
Citations: Google scholar: 183 with h-index of 8

## Publications

- International journals

2024 **Precharattana, M.**, Pitiporntapin, S.*, Sanium S., Kitrungloadjanaporn P., & Phengpom T. Enhancing Teachers' Integrating Micro:bit in their Teaching through Professional Development Program within Smart Farm Context. Kasetsart Journal of Social Science. 2024, *45*(4), 1141-1150.

2024 Tantacharoenrat, C., and **Precharattana, M*.** (2024) The survey of learning experience of pediatric injection among registered nurses and nursing students using a design thinking approach. Journal of Education and Health Promotion, *13*(1), 226.

2023 Fayanto, S., Kuswandi, D., **Precharattana, M**., Tahang, L., & Ali, H. M. (2023). Introduction and Testing about Development the Technology-Based EIGEC Models to Enhance Student Learning Outcomes. Science Education International, *34*(4), 347-355.

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, Songsaksuppachok 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 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.

2018 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.

2018 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.

2018 Choegyal S and **Precharattana M**[*]. Indoor Rainbow Model: an Apparatus for Observing Spectrum in Classroom, Applied Mechanics and Materials 2018; 879: 260-266.

2018 **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.

2011 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

2023 Mongkholsiriwattana, C., Phengpom, T., & **Precharattana, M.** (2023, December). Development of computer-aided learning with hands-on activities kits on topic of gears for a flipped robotics camp. In *Journal of Physics: Conference Series* (Vol. 2653, No. 1, p. 012002). IOP Publishing.

2018 **Precharattana M**, Kajonphol T. A stochastic cellular automata model for rice tillering in the system of rice intensification. InJournal 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 Hans-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.

2014 Choegyal 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.

## Patents

2024 Wireless Sensor-based Newborn Intramuscular Injection Training Manikin

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)

## 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)<br>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 |