

Curriculum Vitae

Nantawachara Jirakittayakorn, Ph.D. (Biomedical Engineering), D.D.S.

Lecturer at Institute for Innovative Learning, Mahidol University

Contact Information

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Education

D.D.S. (2010 – 2023)	Doctor of Dental Surgery	Mahidol University, Thailand (Second class honors)
Ph.D. (2014 – 2019)	Biomedical Engineering	Mahidol University, Thailand Dissertation: Brain modulation during sleep
B.Sc. (2010 – 2014)	Medical Science	Mahidol University, Thailand (Second class honors)

Courses Taught

- 2024 – Present Teach **Instructional Science course (Master Program)**
 - Plan, prepare materials, evaluate learners
 - Deliver active lecture and discussion
- 2024 – Present Teach **Research in Science and Technology Education course (Master Program)**
 - Course coordinator: Develop course syllabus
 - Plan, prepare materials, evaluate learners
 - Deliver active lecture and discussion
 - Help learner develop their proposal
- 2024 – Present Teach **Emerging Technology for Learning course (Master Program)**
 - Plan, prepare materials, evaluate learners
 - Deliver active lecture and discussion in article-based discussion
- 2024 – Present Teach **Biology Education course (Master Program)**
 - Plan, prepare materials, evaluate learners
 - Deliver active lecture and discussion in case-based discussion
- 2024 – Present Teach **Computer Science Education course (Master Program)**
 - Topic: Artificial Intelligence, Data Science
 - Plan, prepare materials, evaluate learners
 - Deliver active lecture and activity in case-based learning
- 2024 – Present Teach **Advanced Research in Science and Technology course (Doctoral Program)**
 - Plan, prepare materials, evaluate learners
 - Deliver active lecture and discussion
 - Help learner develop their proposal
- 2024 – Present Teach **Technology-Enhanced Active Learning course (Doctoral Program)**
 - Plan, prepare materials, evaluate learners
 - Deliver active lecture and discussion in article-based discussion
- 2024 – Present Teach **Principles of Teaching and Learning course (Master Program)**
 - Plan, prepare materials, evaluate learners
 - Deliver active lecture and discussion in case-based discussion
- 2024 – Present Teach **Psychology and Philosophy for Education course (Master Program)**
 - Plan, prepare materials, evaluate learners
 - Deliver active lecture and discussion in case-based discussion
- 2024 – 2025 Teach **Critical Analysis in Science and Technology Education course (Doctoral Program)**
 - Plan, prepare materials, evaluate learners
 - Deliver active lecture and discussion
- 2024 Teach **Polysomnography (PSG) for sleep study** at King Mongkut's Institute of Technology Ladkrabang.
 - Plan, preparation materials and demonstration case for sleep study.
 - Deliver interactive learning to students.

- 2023 Teach **Clinical Correlation of Swallowing and Chewing** at King Mongkut's Institute of Technology Ladkrabang.
 - Plan, preparation materials for discussion.
 - Deliver interactive discussion to students.
- 2023 Teach **Cardiopulmonary Exercise Test Laboratory in Basic Cardiovascular System and Hemostasis** at King Mongkut's Institute of Technology Ladkrabang.
 - Preparation laboratory instruments and materials.
 - Deliver interactive learning to students.
- 2023 Teach **Medical Materials** at Nawamindradhiraj University. (3 credits)
 - Plan, evaluate and revise course content and course materials.
 - Develop and deliver engaging lectures to students.
 - Write course materials such as syllabus, homework assignments and handouts.

Supervision experiences

Major advisor:

- Nuttaphol Seeuchin, 2025. Salivary Biomarkers and Electroencephalography as Predictive Indicators for Evaluating Stress during Dental Scaling Procedure. B.Sc. (Biomedical Science). Mahidol University
- Patarapong Limvipaveeana, 2023. Noise Cancelling System. B.Eng. (Computer Engineering). Rangsit University.
- Nontakorn Lertwachirapiboon, 2023. Sound Prediction using Recurrent Neural Network. B.Eng. (Computer Engineering). Sripatum University. (The 1st prize award)

Co-advisor

- Xintong Hua, 2026. Effects of a 5E Game-Based VR Learning System on International Undergraduates' Cross-Cultural Marketing Competence, Affective Outcomes, and 21st-Century Skills. Ph.D. (Science and Technology Education). Mahidol University.
- Wint Hayman Lwin, (ongoing). A Gamified Bayesian Adaptive Intelligent Tutoring System Integrating the Form, Meaning, Use, and Pronunciation (FMUP) Framework in Enhance Vocabulary Depth and Reading Comprehension in EAL Learners. (Ph.D. student). Mahidol University.
- Sarocha Tiangchangram, (ongoing). A Digital Game-Based 5E Learning Environment with Embedded Predict-Observe-Explain (POE) Activities and AI-Supported Feedback System to Enhance Grade 10 Students. (M.Sc. student). Mahidol University.

Research Experience

- Project manager (2015 – 2025):
 - Medical device development,
 - Face recognition application development,
 - Data analysis and model training
- Researcher (2019 – 2024): Faculty of Dentistry, Mahidol University
- Ph.D. student (2015 – 2019): Brain-Computer Interface Lab
 - Sleep quality improvement
 - Sound and sleep behavior
- Researcher (2015 – 2025): Brain-Computer Interface Lab
 - Brain activities and cognition improvement
 - Sleep technology development
- Researcher assistance (2013 – 2015): Brain-Computer Interface Lab
 - Auditory stimulation and brain responses
 - Cognition responses to stimuli

Research Interests

- Cognition and behavior
- Sleep analysis and sleep improvement
- Sleep technology and medical device
- Auditory stimulation using binaural beat technology.
- Brain responses to stimuli
- AI in Education

International Proceedings

- Precharattana, M., Phengpom, T., Kitrunloadjanaporn, P., Sanium, S., and **Jirakittayakorn, N.** Design and Development of a Gamified Web Platform to Enhance Design-Based Digital Maker Skills in Thai FabLabs. *2025 International Workshop on Artificial Intelligence and Education (WAIE)*.
- Iampanit T., Somprakij P., Siriwanan N., Iampanit N., and **Jirakittayakorn N.**, 2025. A Novel Drowning Detection System and Its Performance Analysis. *22nd International Conference on Electrical Engineering/Electronics, Computer, Telecommunication, and Information Technology (ECTI-CON)*.
- Thanungkul P., **Jirakittayakorn N.**, and Wongsawat Y., "Stress Classification During Dental Procedure," 2022 19th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON), 2022, pp. 1-4, doi: 10.1109/ECTI-CON54298.2022.9795647.
- Soontreekulpong N., **Jirakittayakorn, N.**, and Wongsawat, Y., 2018. Investigation of various manipulated music tempo for reducing negative emotion using beta EEG index. *2018 International Electrical Engineering Congress (iEECON)*, Krabi, Thailand, 2018, pp. 1-4, doi: 10.1109/IEECON.2018.8712229.
- **Jirakittayakorn, N.**, and Wongsawat, Y., 2015. The brain responses to different frequencies of binaural beat sounds on QEEG at cortical level. *Conf Proc IEEE Eng Med Biol Soc*, 2015, 4687-91.
- **Jirakittayakorn N**, Wongsawat Y., 2014. An EMG instrument designed for bruxism detection on masseter muscle *Bmeicon 2014 - 7th Biomedical Engineering International Conference*. DOI: 10.1109/BMEiCON.2014.7017403

Journal Publications

- Saowapark W, **Jirakittayakorn N.** SleepTNet: automatic sleep stage classification with transition model using multi-channel EEG. *IEEE Access*. 2026;14:63894-915. doi: 10.1109/ACCESS.2026.3686667.
- Wechakarn P, Klomchitcharoen S, Jatupornpoonsub T, **Jirakittayakorn N**, Puttanawarut C, Likitsuntonwong W, Chaimongkolnukul, K., Wongsawat Y. Modified stereotactic neurosurgery techniques for rodent surgery enhance survival and reduce surgery time in a severe traumatic brain injury model. *Sci Rep*. 2025;15:22166. doi: 10.1038/s41598-025-05328-y.
- **Jirakittayakorn N**, Manupibul U, Wongsawat Y, Mitirattanakul S. RespNet: a dual-network approach for automated OSA severity classification utilizing PSG type III signals. *IEEE Access*. 2024;12:148538-552. doi: 10.1109/ACCESS.2024.3477266.
- **Jirakittayakorn N**, Wongsawat Y, Mitirattanakul S. An enzyme-inspired specificity in deep learning model for sleep stage classification using multi-channel PSG signals input: separating training approach and its performance on cross-dataset validation for generalizability. *Comput Biol Med*. 2024;182:109138. doi: 10.1016/j.combiomed.2024.109138.
- **Jirakittayakorn N**, Wongsawat Y, Mitirattanakul S. ZleepAnlystNet: a novel deep learning model for automatic sleep stage scoring based on single-channel raw EEG data using separating training. *Sci Rep*. 2024;14(1):9859.
- **Jirakittayakorn N**, Tamboon E, Mitirattanakul S. Effect of 1% H₂O₂ on three salivary stress biomarkers, cortisol, alpha-amylase, and sIgA. *Int Dent J*. 2024;74(2):343-51.
- **Jirakittayakorn N**, Wongsawat Y. A novel insight of effects of a 3-Hz binaural beat on sleep stages during sleep. *Front Hum Neurosci*. 2018;12:387.
- **Jirakittayakorn N**, Wongsawat Y. Brain responses to a 6-Hz binaural beat: effects on general theta rhythm and frontal midline theta activity. *Front Neurosci*. 2017;11:365.
- **Jirakittayakorn N**, Wongsawat Y. Brain responses to 40-Hz binaural beat and effects on emotion and memory. *Int J Psychophysiol*. 2017;120:96-107.

Certificates, Training, and Conferences

- 2024 CITI Program Human Subject Research
- 2023 31st Aug to 1st Sep Attend "Sleep is Essential for Health" by Thai Academy of Sleep Medicine
- 2017 Basic sleep technician certificate from Sleep Society of Thailand
- 2014 Human ethics for biomedical research

Funded projects

- Development of a Prototype Portable Sleep Monitoring Device with an Embedded Automatic Sleep Stage Classification Model 2026
 - o Funding: Fundamental Fund
 - o Financial year: 2026
 - o Principle Investigator: Nantawachara Jirakittayakorn