

# Ekkarat Boonchieng, Ph.D.

Associate Professor, Department of Computer Science, Faculty of Science, Chiang Mai University, Thailand — specializing in interdisciplinary research bridging Computer Science with Biomedical Engineering, Artificial Intelligence, and Health Informatics. Research focuses on Data Clustering and Classification in Healthcare, with significant impact across global research communities.

## 782+

**Citations**

Across 80+ publications

## 25,697+

**Research Reads**

On ResearchGate

## 30+

**Years Active**

CMU since Aug 1993

## 3

**Active Grants**

CMU Fundamental Fund 2024–2026

### Education

**Ph.D. —  
Computer  
Science**

Illinois Institute of  
Technology, USA  
(1995–2000)

**B.S. —  
Computer  
Science**

Khon Kaen  
University, Thailand  
(1986–1990)

**M.S. —  
Computer &  
Information  
Science**

University of New  
Haven, USA (1991–  
1992)

### Current Positions & Affiliations

**Associate Professor**, Dept. of Computer Science, CMU  
(Aug 1993–Present)

- Associate Dean, College of Multidisciplinary and Interdisciplinary Studies
- Associate Dean, Graduate School
- Director, Center of Excellence in Community Health Informatics
- Senior Member, IEEE**
- Guest Editor**, Symmetry Journal (MDPI) — Special Issue: Symmetry and Asymmetry in Image Classification
- ECTI Technical Chair (Computers), ECTI Thailand

**Previous leadership:** Deputy Director, CMU Service Center (2018–2021); Conference Chair — IEEE ICSEC 2010, ICSEC 2025, JCSSE 2025; Organizer — National Olympiad Informatics 2011.

## Research Focus Areas



### Health Informatics

Advanced systems for public health monitoring, disease detection, and remote patient monitoring using mHealth technologies and IoT devices.



### Machine Learning & AI

Data classification, clustering algorithms, extreme learning machines, and neural networks for imbalanced data problems.



### Blockchain Technology

Hyperledger Fabric-based systems for secure patient health data storage and remote patient monitoring solutions.



### mHealth Systems

Mobile health applications for limited-resource communities, focusing on GIS and community-based health data collection.



### IoT & Smart Systems

Smart farm implementations, photovoltaic systems, and integrated IoT solutions for agricultural and industrial applications.



### Biomedical Engineering

Cardiac MRI analysis, pain detection via deep learning, and emotion recognition from EEG and facial expressions.

## Selected Publications (2020–2026)

Publications span top-tier venues including **Nature Scientific Reports**, **IEEE Access**, **IEEE Sensors Journal**, **Advanced Intelligent Systems**, **Symmetry (MDPI)**, and **Elsevier** journals. Key recent works include:

### Blockchain & Health Records (2025–2026)

- Integrating Transparency and Privacy in Grievance Redressal Through Hyperledger Fabric — *Scientific Reports*, Vol. 16, 2026
- Blockchain-Enabled Electronic Health Record Model for Managing Patients Vital Data — *Blockchain in Healthcare Today*, Vol. 9, 2026
- Convergence of Blockchain and IoT for Managing Decentralized Medical Records — *Scientific Reports*, Vol. 15, 2025
- Hyperledger Fabric Based Remote Patient Monitoring Solution — *IJACSA*, 2025

### AI, ML & Imbalanced Data (2024–2026)

- Attention-Based Deep Learning for Lung Nodule Classification in CT Images — *Symmetry*, Vol. 18, 2026
- Solving Data Overlapping Using Class-Separable Extreme Learning Machine Auto-Encoder — *Advanced Intelligent Systems*, 2025
- FLEX-SMOTE: Synthetic Over-sampling for Minority Class Distributions — *PMC Journal*, 2025
- Nodules Detection in Lungs CT Images Using Improved YOLOv5 and CNN-SVM — *IEEE Access*, 2024

### Disease Detection & Biomedical (2021–2024)

- Automated Detection of Diabetes from Exhaled Human Breath Using Deep Hybrid Architecture — *IEEE Access*, Vol. 11, 2023
- Influenza, Dengue and Common Cold Detection Using LSTM — *BioData Mining*, 2022
- 2D Facial Expression and Movement for Pain Identification With Deep Learning — *IEEE Access*, Vol. 9, 2021
- mHealth Technology Translation in a Limited Resources Community — *IEEE JTEHM*, Vol. 9, 2021

Earlier landmark works include *Consumer Grade Brain Sensing for Emotion Recognition* (IEEE Sensors Journal, 2019), *Smart Farm: Applying NodeMCU, IoT, NETPIE and LINE API* (IEICE Transactions, 2018), cardiac MRI image processing (BMEiCon, 2012), and 3D reconstruction of blood flow within the left ventricle (Computers in Cardiology, 2001).

## Research Projects & Funding

### CMU Fundamental Fund 2024–2026

Extreme learning machine auto-encoding and class-separable methods for data overlapping. Utilizes CMU HPC ERAWAN system for complex computations.

### Open Urban Data Project

Thailand Research Fund — development of urban data collection and analysis systems for smart city initiatives.

### Chiang Mai Community Health

Thai Health Promotion Foundation — community-based health monitoring system in semi-rural districts.

### International Research Network

Thailand Science Research and Innovation Fund — Digital Image Processing and Machine Learning collaborative network.

### Contact

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### Research Interests

BIOMEDICAL ENGINEERING

ARTIFICIAL INTELLIGENCE

MACHINE LEARNING

BLOCKCHAIN

IOT

HEALTH INFORMATICS

DEEP LEARNING

MHEALTH

CLOUD COMPUTING

IMAGE PROCESSING