






# Romrawin (Jin) Chumpu

Master of Science,  
Engineering and Technology (Computer Science)

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## EDUCATION

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### Graduate Visiting Student

📅 2023

- 📍 Stanford University
- 💰 Summer Session tuition grant

### Master of Science, Engineering and Technology (Computer Science)

📅 2019-2022

- 📍 Sirindhorn International Institute of Technology, Thammasat University
- 💰 Junior Science Talent Project (Mathematics) and Excellence Thai Students scholarship
- 🏢 Lab: Functional Advanced Materials Engineering laboratory (FAME)
- 📄 Simulation and control of drug release on microneedle using machine learning technique
- 👤 Supervisors: Assist. Prof. Shu-Han Hsu and Dr. Sanparith Marukatat

### Bachelor of Engineering (First-Class Honors), Chemical Engineering

📅 2015-2019

- 🎓 Minor in Bio-Chemical Engineering
- 📍 Sirindhorn International Institute of Technology, Thammasat University
- 💰 Junior Science Talent Project (Mathematics) scholarship

### Exchange Student, Chemical Engineering

📅 2018-2019

- 📍 University of Waterloo, Canada
- 💰 Junior Science Talent Project (Mathematics) research grant and Nishino scholarship
- 🏢 Lab: Computational MultiPhysics (CoMPhys) research group
- 📄 Simulation-based Design of Aeroponics Nutrient Distribution System Using multiple CFD
- 👤 Supervisor: Assoc. Prof. Nasser Mohieddin Abukhdeir

## WORK EXPERIENCE

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### Research Assistant - Image Processing and Understanding Research Team

📅 4/2022-6/2023

- 📍 National Electronics and Computer Technology Center (NECTEC)
  - **Image captioning** - experimented state-of-the-art image captioning in Thai
  - **Image generation** - trained images on a large and specific Thai dataset (e.g, a food dataset)
  - **Character-based encoder Transformers**
    - experimented how Thai characters encode in Transformer training
  - **Multimodal image and text models**
    - finetuned CLIP and CoCa using Thai captions translated from MSCOCO dataset
  - **Image multi-captioning**
    - experimented on a trained image captioning model with multi-caption input
  - **Cross-language latent relation**
    - investigated the connection between latent spaces across multi-language models
  - **Facial component swapping**
    - conducted a novel method of face component swapping for face privacy and realism
  - **End-to-end machine learning project**
    - carried out a project that included generating a dataset, training a model, and deploying models to a demo/API
  - **Dataset web scraping** - scraped and generated datasets from public websites
  - **High performance computing**
    - used supercomputers TARA and LANTA to train and optimize large models
  - **Huge Hugging Face user** - utilized all of Hugging Face's services during the work

**Graduate Co-Researcher - Image Processing and Understanding Research Team** 📅 3/2021-2/2022

📍 National Electronics and Computer Technology Center (NECTEC)

- **Face texture blending** | Poster
  - experimented face texture blending technique using pretrained UNet and GANs
- **Face's components clustering**
  - created an automatic extraction from facial key points and grouped face component types
- **3D face generation**
  - researched with 3D face models and programmed automatic generative 3D face
  - experimented on face UV mapping and improved realistic texture
- **Face composition**
  - programmed face swapping composition collaborated with the Royal Thai Police

**AI Engineer - Super AI Engineer Development Program**

📍 Artificial Intelligence Association of Thailand (AIAT)

👤 **Project Manager** - Palm kernel classification with Southern Palm company

📅 2/2022-8/2022

📅 **AI Engineer** - Super AI Engineer Development Program Season 1

📅 6/2020-7/2021

- *Featured projects:* credit card recommendation (KBTG), 3D point cloud registration and reconstruction (Department of Rural Roads), QA system (SCG), robot arm movement (CU), image classification and detection (DENSO, Wazzadu, AI Mask), automatic speech recognition (NECTEC), failure detection from industrial line signal (IRPC)

**Summer Research Internship - Department of Chemical Engineering**

📅 6/2018-8/2018

📍 University of Waterloo, Canada

👤 Nishino scholarship

📅 Computational Fluid Dynamics (CFD) analysis of an antibiotic drug eluting on orthopedic implants simulation

👤 Supervisor: Prof. Peter L. Douglas

## TEACHING

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**Teaching Assistant - Super AI Engineer Development Program**

📍 Artificial Intelligence Association of Thailand (AIAT)

👤 Super AI Engineer Development Program Season 3 - Pangpuriye

📅 2/2023-4/2023

👤 Super AI Engineer Development Program Season 2 - Observer

📅 2/2022-4/2022

» Guiding a new generation of AI developers through hackathons and other AI-related projects

**Teaching Assistant - Main TA**

📅 8/2019-7/2021

📍 Sirindhorn International Institute of Technology, Thammasat University

- ITS100 Introduction to Programming
- TU103 Life and Sustainability
- TU106 Creativity and Communication
- GTS111 Probabilistic for Technologists

» Teaching first-year laboratory and communicating between classrooms with multiple instructors

**Grader - Main grader**

📅 8/2019-5/2021

📍 Sirindhorn International Institute of Technology, Thammasat University

- GTS116 Mathematics I
- GTS112 Linear Algebra
- SCS126 Chemistry for Engineers (Co grader)
- GTS111 Probabilistic for Technologists

» Grading assignments and providing the correct explanations

**Tutor System Administrator**

📅 9/2019-7/2021

📍 Sirindhorn International Institute of Technology, Thammasat University

» Assisting students with their homework and providing guidance for all first-year courses

» Advising students on how to adjust to university-level classes

**Volunteer science teacher/Lead academic - Science teacher in remote areas**





📅 5/2012-6/2017

📍 Faculty of Science, Chiang Mai University

» Teaching science to elementary and high school students in Thailand's remote areas

## ACTIVITIES

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- Volunteer Staff** - NeurIPS 2023 Conference  2023  
📍 Neural Information Processing Systems Foundation
- Judge in Round 2** - National Software Contest (NSC) 2022  2023  
📍 National Science and Technology Development Agency (NSTDA)
- Volunteer Staff** - Junior Science Talent Project  2016-2023  
📍 National Science and Technology Development Agency (NSTDA)  
» Moderating oral presentation in mathematics and computer science and managing overall activity
- SIIT Hackathon Volunteer Staff**  2016-2019  
📍 Sirindhorn International Institute of Technology, Thammasat University  
» Guiding students who participate in hackathon tackling programming problems

## AWARDS AND HONORS

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-  **Best Project Award** - CS148 Introduction to Computer Graphics and Imaging  2023  
📍 Stanford University
-  **Super AI Engineer - The Reality Show** (10/8000 participants)  2022  
📍 Artificial Intelligence Association of Thailand (AIAT)  
★ Representative of a researcher and woman in AI  
» A cast in TV show competition with AI problem solving challenges
-  **One of Thirty People Who Contributed to SIIT Reputation**  2022  
★ In celebration of SIIT 30th year  
📍 Sirindhorn International Institute of Technology, Thammasat University
-  **The 10th of Global Young Scientist Summit (GYSS)**  2022  
📍 National Science Foundation of Singapore (NSF)  
» Joined a panel in AI, Ethics and Governance with Prof. Cédric Villani and Prof. Leslie Valiant
-  **Outstanding Submission** - ML for predicting materials property (1/100 groups)  2021  
📍 Thailand Machine Learning for Chemistry Competition
-  **Silver Medal - Advanced AI Certificate** (10/3500 participants)  2021  
📍 Artificial Intelligence Association of Thailand (AIAT)
-  **Best Poster Award - Face Generation Project** (3/3500 participants)  2021  
📍 Artificial Intelligence Association of Thailand (AIAT)
-  **Outstanding Performance Award** - Global Leadership Program  2020  
📍 Sirindhorn International Institute of Technology, Thammasat University  
★ Award to students who have contributed to SIIT Reputation
-  **First-Class Honors in Bio-Chemical Engineering and Technology**  2019  
📍 Sirindhorn International Institute of Technology, Thammasat University
-  **Long-term Junior Science Talent Project Scholarship in Mathematics**  2015  
★ Best mathematics project (1/65 projects, 3/1000 proposals)  
📍 National Science and Technology Development Agency (NSTDA)  
» Awarded scholarship and research funding up to the doctoral level in Thailand institution
-  **Science Classroom in University Affiliated School Project Scholarship**  2012  
📍 Chiang Mai University  
» Project-based science classroom by the Ministry of Science (30/1000 students)

## PUBLICATIONS

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1. **R. Chumpu**, C.-L. Chu, T. Treeratanaphitak, S. Marukatat, and S.-H. Hsu, "Physics-informed graph neural networks accelerating microneedle simulations towards novelty of micro-nano scale materials discovery", Engineering Applications of Artificial Intelligence, vol. 126, p. 106894, 2023.
2. **R. Chumpu**, P. Temniranrat and S. Marukatat, "Synthetic face generation from in-the-wild face components swapping," The 17th International Joint Symposium on Artificial Intelligence and Natural Language Processing (iSAI-NLP), Chiang Mai, Thailand, 2022, pp. 1-6, doi: 10.1109/iSAI-NLP56921.2022.9960274.
3. W. Bholsithi, N. Wongwaen, C. Sinthanayothin, **R. Chumpu**, P. C. Nitiphat and P. C. C. Burana, "Z-Face Sketch : Automatic Placement of Face Composites for Composite Sketches," 2022 International Conference on Digital Government Technology and Innovation (DGTi-CON), Bangkok, Thailand, 2022, pp. 96-100, doi: 10.1109/DGTi-CON53875.2022.9849208.
4. **R. Chumpu**, "Simulation and control of drug release on microneedle using machine learning technique," Thammasat University, 2021.
5. **R. Chumpu**, S.-H. Hsu, and C.-L. Chu, "Two-Way Coupling Computational Fluid Dynamics with Explicit Dynamics Modeling and Simulation of Microneedle," The International Conference in Mathematics and Applications (ICMA-MU), Bangkok, Thailand, 2020.
6. **R. Chumpu**, N. Khamsemanan, and C. Nattee, "The association between dengue incidences and provincial-level weather variables in Thailand from 2001 to 2014," PLOS ONE, vol. 14, no. 12, pp. 1–27, 12 2019.
7. **R. Chumpu**, N. Khamsemanan, and C. Nattee, "Influenza Activity and Province-level Weather Variations in Thailand, 2009 to 2014, Using Random Forest Time-series Approach," Chiang Mai Journal of Science, Vol. 45, No.6, 2509 – 2514, 2018.

## ON-GOING PUBLICATIONS

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1. **R. Chumpu**, "Insight findings from materials simulation with physics guided features on graph attention networks," in revising and plan to submit to conference in 2024.
2. **R. Chumpu**, T. Treeratanaphitak, S.-H. Hsu, and S. Marukatat, "MN-SIM: Microneedle Simulation Dataset and Benchmark Models," in revising and plan to submit to conference in 2024 (Full dataset paper).

## CONFERENCE PRESENTATIONS

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1. **R. Chumpu**, P. Temniranrat, S. Marukatat, "Synthetic face generation from in-the-wild face components swapping," Online presented at OAMLS: Online Asian Machine Learning School as a part of 14th Asian Conference on Machine Learning (ACML 2022), Hyderabad, India.
2. A. Ussama, **R. Chumpu**, "Oil palm bunch quality classification using semi-supervised approach," Oral presented at the 2nd International Conference on Robotics, Automation and Artificial Intelligence (RAAI 2022), Singapore.
3. N. Suwansawang, **R. Chumpu**, "Drone imagery with supervised learning inspired palm tree counting and quality prediction," Oral presented at the 2nd International Conference on Robotics, Automation and Artificial Intelligence (RAAI 2022), Singapore.
4. **R. Chumpu**, SH. Hsu and CL. Chu, "Numerical Simulation of Microneedle Materials," Poster presented at the 21st International Union of Materials Research Societies - International Conference in Asia (IUMRS-ICA 2021), Bangkok, Thailand.
5. **R. Chumpu**, N. Khamsemanan , and C. Nattee, "Prediction of dengue incidences in Thailand using a quasi-likelihood generalized linear model," Oral presented at the 10th Anniversary Conference on Nonlinear Analysis and Convex Analysis (NACA 2017) at Chitose City Cultural Center Hokkaido, Chitose, Japan.