Romrawin Chumpu

Master of Science,
Engineering and Technology (Computer Science)

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Google Scholar

Education

Graduate Visiting Student, Computer Science — 2023
- Stanford University
- Summer Session tuition grant
- CS148, CS229, EFSLANG698S, ME344S

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

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 the more realistic facial look
  - **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 blending** - experimented face blending technique using pretrained UNet and GANs
- **Face component clustering**
  - created an automated extraction (eyes, nose, mouth) and grouping of face component types
- **3D face generation**
  - substantial studied on how to build 3D face models and autonomous 3D face generation
  - experimented on face UV mapping and 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 - Image Processing with Southern Palm company — 2/2022-8/2022
AI Developer - Super AI Engineer Development Program Season 1 — 6/2020-7/2021
- solved Thailand's societal problems with NLP, signal processing, image processing, and data science

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

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

Grader - Main/co grader — 8/2019-5/2021
Sirindhorn International Institute of Technology, Thammasat University

- GTS116 Mathematics I
- GTS112 Linear Algebra
- SCS126 Chemistry for Engineers
- GTS111 Probabilistic for Technologists

Tutor System Administrator — 9/2019-7/2021
Sirindhorn International Institute of Technology, Thammasat University

» Assisting freshmen students with their homework and provided explanations in all courses
» Advising students on how to adjust to university-level classes

Volunteer teacher - 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

AWARDS AND HONORS

Best Project Award - CS148 Introduction to Computer Graphics — 2023
Stanford University

Super AI Engineer - The Reality Show (10/8000 participants) — 2022
Artificial Intelligence Association of Thailand (AIAT)
» A new TV show completing with AI coding and problem-solving skills for social challenges

One of Thirty People who Contributed 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 — 2016
★ Best mathematics project (1/65 projects, 1/1000 proposals)
National Science and Technology Development Agency (NSTDA)
» Awarded scholarship and research funding up to the doctoral level in Thailand institution

PUBLICATIONS

1. **R. Chumpu**, T. Treeratanaphitak, S.-H. Hsu, and S. Marukatat, "MN-SIM: Microneedle Simulation Dataset and Benchmark Models," plan to submit to SIGGRAPH 2024. (Full dataset paper)

2. **R. Chumpu**, "Learning-to-simulate findings from materials simulation guided to new perspective of materials discovery," plan to submit to AI4Mat Workshop at NeurIPS 2023.

3. **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.

4. **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.

5. 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.

6. **R. Chumpu**, "Simulation and control of drug release on microneedle using machine learning technique," Thammasat University, 2021.

7. **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.

8. **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.

9. **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.

CONFERENCE PRESENTATIONS

1. **R. Chumpu**, P. Temniranrat, S. Marukatat, "Synthetic face generation from in-the-wild face components swapping," Presented online at OAMLS: Online Asian Machine Learning School as a part of 14th Asian Conference on Machine Learning (ACML 2022), Hyderabad, India.

2. **R. Chumpu**, SH. Hsu and CL. Chu, "Numerical Simulation of Microneedle Materials," Presented at the 21st International Union of Materials Research Societies - International Conference in Asia (IUMRS-ICA 2021), Bangkok, Thailand.

3. **R. Chumpu**, N. Khamsemanan , and C. Nattee, "Prediction of dengue incidences in Thailand using a quasi-likelihood generalized linear model," Presented at the 10th Anniversary Conference on Nonlinear Analysis and Convex Analysis (NACA 2017) at Chitose City Cultural Center Hokkaido, Chitose, Japan.

(Last update: September 2023)