Kantaphan Punnaanan

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Objective

A dynamic chemical engineering professional with a robust academic background and diverse industrial experience, specializing in process simulation, techno-economic analysis, and sustainable technology development. Committed to driving innovation in chemical engineering through interdisciplinary approaches and cutting-edge research.

Educations

Master of Science in Chemical Technology *(Pursuing)* Aug 2023 – Present
GPA: 3.59
Chulalongkorn University, Bangkok, Thailand
Summary: Received an H.M. King Bhumibol Adulyadej's 72nd Birthday Anniversary Scholarship offer to pursue a master degree. My research focus for the dissertation revolved around process simulation and techno-economic analysis of converting bioprocesses to value-added products and investigating the feasibility of scaling to commercial levels.
Relevant courses: Transport Phenomena, Chemical Reactor Design, Fundamental Process Design and Analysis, Experiments Design and Modeling, Advanced Bioprocesses For Chemical Industry, Optimization In Chemical Technology, Separations Operations, Fluidization, Entrepreneur for the Sustainable Fuels, Application Aspect of Thermodynamics in Process Simulation

Bachelor of Science in Chemical Engineering *(Emphasis on Chemical Technology)* Aug 2018 – Jun 2022
GPA: 3.01
Chulalongkorn University, Bangkok, Thailand
Summary: Funded through a competitive university scholarship, this research investigated green process simulation for liquefied natural gas (LNG) cold energy utilization and molecular dynamics simulation of novel zinc-ion battery (ZIB) additives. Employed computational modeling techniques to analyze thermal energy recovery mechanisms and ionic interaction dynamics, with the primary objective of advancing sustainable energy system design and materials engineering performance optimization.
Relevant courses: Chemical Engineering Kinetics, Thermodynamics, Heat and Mass Transfer, Momentum Transfer, Process Dynamics and Control, Chemical Process and Plant Design, Chemical Process Safety, Pollution Control for Chemical Industries, Industrial Water Supply and Waste Water Treatment, Biochemical Technology, Polymer Technology, Unit Operations Laboratory, Computer Application for Chemical Industries

High School Diploma *(Science and Mathematics Program)* May 2015 – Apr 2018
GPA: 3.87
Pibulwitthayalai School, Lopburi, Thailand
Summary: Accomplished school representative with exceptional leadership capabilities and distinguished academic achievements. Proven expertise in public relations, serving as Master of Ceremonies for school events and ASEAN Youth Camp delegate. Secured admission to a prestigious university, demonstrating outstanding scholastic excellence and interpersonal skills. Adept at representing institutional values with confidence, professionalism, and cross-cultural communication prowess.
Relevant courses: Mathematics, Physics, Chemistry, Biology, English for Academic Purpose, English Communication

Experiences

Chemical Engineer Apr 2023 – Aug 2023
Thai Rayon Public Company Limited *(Aditya Birla Group)*, Ang Thong, Thailand

- Quality & Production Optimization: Improved quality and production efficiency of rayon fibers in the Spinning Section

- Technical Expertise: Developed expertise in Quality Control, Production Planning, DCS Control, Fire Safety, Operations, Negotiations, and Intensive Engineering Skills through comprehensive training
- Shift Management: Led shift operations as a Chemical Engineer at Thai Rayon PLC, ensuring smooth and efficient production processes

Associate Engineer Aug 2022 – Jan 2023

i APC Consulting Company Limited, Bangkok, Thailand

- Chemical Process Data Analysis: Conducted data analysis, visualization, and modeling of chemical processes using tools such as Excel, PowerPoint, and Aspen DMC3
- Polymer Process Monitoring & Reporting: Supported process monitoring and reporting activities for the polymer process, including calculating process benefits and identifying areas for improvement
- Process Control Training: Received training in PID tuning, Distributed Control Systems (DCS), Advanced Process Control (APC) software, and Basic Engineering Skills

Internship Jun 2021 – Aug 2021

Singburi Sugar Company Limited *(Mitr Phol Group)*, Singburi, Thailand

- Internship Summary: Presented a comprehensive summary of the sugar manufacturing process based on internship experience
- Process Data Analysis & Reporting: Supported Process Engineers by collecting data and writing reports for the vacuum pan section of the sugar manufacturing proces
- Sugar Quality Assurance: Assisted the R&D department in quality control activities related to sugar production
- Sugar Production Training: Received training in all aspects of the sugar manufacturing process, from raw material processing to refined sugar production

Academic Projects

Thesis *(Master Degree)* Aug 2023 – Present

Chulalongkorn University

"Techno-Economic Analysis Of Ulva Spp. Cultivation for Capturing CO_2 Emissions from Natural Gas Power Plants in Thailand". Kantaphan P.

Summary: Anthropogenic activities significantly contribute to global warming through greenhouse gas emissions, particularly from fossil fuel combustion. Natural gas power plants in Thailand account for 38.3% of CO_2 emissions in the energy sector. This study explores macroalgae, specifically *Ulva spp.*, as a promising carbon capture technology with photosynthetic efficiencies 16.67% higher than terrestrial plantations. Using SuperPro Designer simulation, researchers analyzed Ulva spp. cultivation for CO_2 capture from a Rayong power plant's flue gases. The optimal cultivation conditions yielded 29.90 ton/L/year biomass with a 42.89% internal rate of return, demonstrating potential for Thailand's carbon sequestration strategy.

Senior Project *(Bachelor Degree)* Sep 2021 – May 2022

Chulalongkorn University

"Effect of Electrolyte Composition on Structure and Transport Properties of Ions in Aqueous Zinc-Ion Batteries: A Molecular Dynamics Study". Kantaphan P., Phenphitcha H.

Summary: Molecular dynamics simulations examined zinc sulfate, zinc triflate, and zinc triflimide in aqueous electrolytes at 0.5, 1.0, and 1.5 M, along with manganese additives at 0.1 M. The solvation structure of Zn^{2+} ions remained consistent, surrounded by six water molecules at 2 Å. Increasing electrolyte concentration resulted in decreased ionic conductivity in all systems

Design Project *(Bachelor Degree)* Jun 2021 – Feb 2022

Thai Institute of Chemical Engineering and Applied Chemistry

"The Design for LNG Cold Energy Utilised Processes by Using an ASPEN HYSYS Simulation". Kantaphan P., Tankit K.

Summary: The study explores the optimization of liquefied natural gas (LNG) cold energy utilization through ASPEN HYSYS simulation. It models various processes, demonstrating significant energy savings and reduced operational costs. The findings suggest that integrating LNG cold energy can enhance industrial energy efficiency and sustainability

Scholarships & Awards

Best Oral Presentation 2025
The Thai Institute of Chemical Engineering and Applied Chemistry (TIChE)
Receives the award at The 34^{th} Thai Institution of Chemical Engineering and Applied Chemistry International Conference (TIChE2025) for research on "Techno-Economic Analysis of Ulva spp. Cultivation for Capturing CO_2 Emissions from Natural Gas Power Plants in Thailand." validates our innovative approach to carbon capture using macroalgae cultivation, demonstrating economic viability and environmental benefits for Thailand's transition toward sustainable energy production.

Outstanding Science Student Award (Graduate Level) 2024
Chulalongkorn University
Receives the award from the Faculty of Science, Chulalongkorn University, which is a prestigious recognition of academic excellence, leadership, and contributions to the university. It honors a graduate student who has demonstrated exceptional performance in studies, leadership in academic or extracurricular activities, and a commitment to advancing scientific knowledge.

H.M. the King Bhumibhol Adulyadej's 72nd Birthday Anniversary Scholarship 2023 – Present
Chulalongkorn University
Receives an offer to pursue an M.Sc. in Chemical Technology at the Department of Chemical Technology, Chulalongkorn University. My research focus for the dissertation will revolve around process simulation and techno-economic analysis of converting bioprocess to value-added product and investigating feasibility of scaling to commercial levels

University Scholarship 2019 – 2022
Chulalongkorn University
Full tuition with monthly stipend during undergraduate level studies for the attainment of the good level of education possible in a specific field and the university's activities

Education Scholarship 2018
Siam Commercial Bank PCL.
Full tuition for the first year of studies aimed at achieving a high level of proficiency in the English language

Certifications

Associate Engineer in Chemical Engineering Feb 2024
Council of Engineer Thailand

MATLAB Fundamentals Feb 2023
MathWorks

Intermediate Python Nov 2022
DataCamp

Chemical Safety Training for Research Students and Researchers Aug 2021
Center for Safety, Health and Environment of Chulalongkorn University
Credential ID: 64130417

Intro to Python Dec 2021
Chulalongkorn University Values Integration Program

Skills

- **General Software**: Microsoft Office (Word, Excel, PowerPoint), Adobe Premiere Pro, Capcut, Canva, Adobe Photoshop
- **Engineering Software**: Aspen HYSYS, Aspen Plus, Aspen DMC3, AutoCAD, MATLAB, Simulink, Ansys Fluent

- **Researching Software**: SuperPro Designer, GROMACS, VMD, Putty, WinSCP
- **Programming**: Python, HTML, Javascript, Microsoft Visual Studio Code, GitHub, Glide
- **Technical Skills**: Process Monitoring, Report Writing, Data Analysis, Data Visualization
- **Soft Skills**: Creativity, Leadership & Management, Communication, Review Articles & Experimental Research

Languages

- **Thai** *(Native)*
- **English** ***(B1**: Upper intermediate)* CU-TEP: 72, TOEFL ITP: 497

Other Experiences

Teaching Assistant Jan 2025 – Present
Chulalongkorn School of Integrated Innovation

- Developed and delivered EngiLogic: Engineering Concept to Application for freshman students (BAScii batch 006)
- Emphasizes: Systems and Software Engineering, Physical Engineering, Safety Engineering bridging the gap between theoretical concepts and real-world applications

Teaching Assistant Aug 2024 – Present
Department of Chemical Technology, Faculty of Science, Chulalongkorn University

- Instructed undergraduate students in Levels Control and Flow Measurement, and 2D Bubble Bed operations
- Emphasizes: PID Control, Flow Characteristics, Equipment Selections

Research Assistant Jul 2023 – Present
Department of Chemical Engineering, Faculty of Science, Chulalongkorn University

- Co-authored: A review paper on the status of algae in Southeast Asia by analyzed current research and trends, providing insights for environmental sustainability
- Provided and collected data: Assisted in ensuring accurate financial planning and successful event execution
- Research Assistant: Sustainable Algal Cultivation and Applications (SACAS) Research Unit, Department of Chemical Engineering, Faculty of Engineering, Chulalongkorn University

Software Developer (Part-time) Nov 2023 – May 2024
WE Tech Consulting Co., Ltd., Bangkok, Thailand

- Web Designer: Designed an engaging HTML landing page for the Thammasat Law Center website using GoDaddy, improving user experience and online presence
- Software Designer: Developed a user-friendly HRM software solution for the Faculty of Law at Thammasat University using Glide, streamlining HR processes
- Low-Code Developer: Accelerated application development using Glide's low-code platform, enabling rapid prototyping and deployment

Coordinator May 2023 – Mar 2024
The Thai Institute of Chemical Engineering and Applied Chemistry, Bangkok, Thailand

- Administrative Support: Streamlined team operations by managing correspondence, scheduling meetings, preparing reports, and maintaining accurate records
- Event Coordinator: Contributed to the successful execution of events, workshops, and conferences through effective organization and coordination

Engineering Coordinator (Part-time) Mar 2023 – Dec 2023
Innovare Co., Ltd., Osaka, Japan

- Project Planning & Execution: Enhanced team collaboration and project efficiency through strategic project planning and resource allocation
- Project Management & Reporting: Ensured project success by diligently tracking deadlines, maintaining comprehensive documentation, and facilitating informed decision-makin
- Market Research & Opportunity Identification: Identified potential market opportunities for rubber seed oils through comprehensive research and analysis

Volunteer Teacher Nov 2022 – Feb 2023
Saturday School Foundation, Bangkok, Thailand

- English Teacher: Taught English to primary school students in Bangkok
- Lesson Planning: Developed adaptive lesson plans tailored to meet students' individual needs
- Activity Creation: Designed engaging activities to enhance the quality of learning

Volunteer Jun 2022 – Jun 2023
Chulalongkorn University Alumni Association under the King's Patronage

- Stage Coordinator: Ran as Stage Coordinator for the 106th Year Chula Homecoming
- Administration: Served as Admin for Chula Alumni LINE OA
- Editor: Served as an Editor for the King Chulalongkorn Memorial Day book (2022)
- Volunteer Staff: Served as Volunteer Staff for the DSR program at Chula Alumni

VIC Volunteer Dec 2019
Engineering Student Committee, Faculty of Engineering, Chulalongkorn University

- Volunteer: Served as a Volunteer at the 3rd Voluntary Intania Camp (Vidvapathcamp)
- Project Contribution: Built a water dam for a rural village in Nan, Thailand

Volunteer Staff Feb 2019 – Feb 2020
Student Government of Chulalongkorn University

- Radio Communication Network Administrator: Served as Radio Communication Network Administrator Staff for the 73rd and 74th CU-TU Traditional Football
- Event Support: Served as Radio Communication Network Administrator Staff for CU Freshman Orientation 2019

Broadcaster 2015 – 2018
Public Relations of Pibulwitthayalai School

- Radio Broadcaster: Served as a Radio Broadcaster in the Public Relations department of Pibulwitthayalai School during studies

Extracurricular Activities

- Co-founding Member: Served as a Co-founding Member of the CT Alpha Group, responsible for creating media infographics and organizing events for the Department of Chemical Technology

  Aug 2021 – Present

- Web Developer: Served as a Web Developer for updating the NIAB Lab website and i-SMaT website, including content creation

  Aug 2021 – Present

- Competition Representative: Served as the Representative of the Department of Chemical Technology at the 3rd Chemical Engineering Design Competition at the Thai Institute of Chemical Engineering and Applied Chemistry (TIChE)

  Jun 2021 – Feb 2022

- Member of CU Dormitory Government: Served as a Member of the CU Dormitory Government, representing students to communicate with the head of the Dormitory Government and ensuring their well-being

  Aug 2021 – Dec 2021

- Competition Representative: Served as a representative at the Thailand Machine Learning for Chemistry Competition (TMLCC), where AI and ML were utilized to identify artificial components

  Sep 2021 – Oct 2021

Interests & Hobbies

- **Engineering Technologies**
  - Process Simulation & Design
  - Chemical Reaction Engineering
  - Biochemical Engineering & Bio-refinery
- **Sustainable Development**
  - Bio-Circular-Green Technology
  - Circular Economy Strategies
  - Sustainable Innovation Approaches
- **Technology & Computing**
  - Computer Programming
  - Software Development
  - Emerging Technology Trends
- **Creative Interests**
  - Movie Enthusiast
  - Music Appreciation
  - Multimedia Content Exploration

References

Asst. Prof. Dr. Pichaya In-na (pichaya.i@chula.ac.th)
Master Degree's Advisor
Assistant Professor at Department of Chemical Technology, Faculty of Science, Chulalongkorn University

Dr. Christopher Dixon (christopher.d@chula.ac.th)
Master Degree's Advisor
Lecturere at Chulalongkorn School of Integrated Innovation, Chulalongkorn University

Assoc. Prof. Kasidit Nootong (kasidit.n@chula.ac.th)
Master Degree's Advisor
Associate Professor at Department of Chemical Engineering, Faculty of Engineering, Chulalongkorn University

Prof. Dr. Napida Hinchiranan (napida.h@chula.ac.th)
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Professor at Department of Chemical Technology, Faculty of Science, Chulalongkorn University

Asst. Prof. Dr. Manaswee Suttipong (manaswee.s@chula.ac.th)
Bachelor Degree Project's Advisor
Assistant Professor at Department of Chemical Technology, Faculty of Science, Chulalongkorn University

Asst. Prof. Dr. Nuttapol Pootrakulchote (nuttapol.p@chula.ac.th)
Design Project's Advisor
Assistant Professor at Department of Chemical Technology, Faculty of Science, Chulalongkorn University

Mr. Nathapol Pintuyothin (nathapol.p@chula.ac.th)
Design Project's Advisor
Lecturer at Department of Chemical Technology, Faculty of Science, Chulalongkorn University

Ms. Kittiya Patcharapong (kittiya.p@adityabirla.com)
Human Resources Department
Thai Rayon Public Company Limited

References are available upon request