

## Profile

**Name Surname** Asst. Prof. Acting Sub LT. Dr.Phichitphon Chotikunnan

**Present Position** Lecturer of Biomedical Engineering Program

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**SCOPUD ID** : 56308222400, **ORCID** : <https://orcid.org/0000-0002-6617-6805>

**Original Institute** College of Biomedical Engineering, Rangsit University

**Address** College of Biomedical Engineering, Rangsit University

52/347 Muangaek, Phahonyothin, Lakhok, Muang, Phatumthani 12000

**Tel** 029972200 Ext 1011

**Fax** 029972200 Ext 1408

**Phone** 089-0050669, 085-2530753

**E-mail:** Phichitphon.c@rsu.ac.th / Opor\_pupa@hotmail.com



### Specialized Field of Academic

Specialized Field: Robotic, Embedded System, Fuzzy Logic Control, and Iterative Learning Control.

### Associate Editors

International Journal of Robotics and Control Systems (e-ISSN: 2775-2658) [Scopus indexed journal]

### Education, Educational Institution, Course of Study and Qualification

**2022 Doctor of Engineering Program in Electrical and Information Engineering**

(Department of Control System and Instrumentation Engineering),

King Mongkut's University of Technology Thonburi

#### International journal indexed in ISI

P. Chotikunnan, B. Panomruttanarug, and P. Manoonpong, "Dual design iterative learning controller for robotic manipulator application," Journal of Control Engineering and Applied Informatics, vol. 24, no. 3, pp. 76-85, 2022.

P. Chotikunnan and B. Panomruttanarug, "Practical design of a time-varying iterative learning control law using fuzzy logic," Journal of Intelligent & Fuzzy Systems, vol. 43, no. 3, pp. 2419-2434, Jul. 2022.

**2015 Master of Engineering in Electrical Engineering**

(Department of Control System and Instrumentation Engineering),

King Mongkut's University of Technology Thonburi

#### International journal indexed in ISI

P. Chotikunnan and B. Panomruttanarug, "The application of fuzzy logic control to balance a wheelchair," Journal of Control Engineering and Applied Informatics, vol. 18, no. 3, 2015.

#### International Conference

B. Panomruttanarug and P. Chotikunnan, "Self-balancing iBOT-like wheelchair based on type-1 and interval type-2 fuzzy control," in Proc. 11th International Conference on Electrical Engineering, Electronics, Computer, Telecommunications and Information Technology (ECTI-CON), 2014.

**2011 Bachelor of Engineering in Mechatronics Engineering**

Pathumwan Institute of Technology

## Internal and External Country Research Management Experiences

### Published Journal

#### International journals indexed in Scopus

N. Thongpance, P. Dangyai, K. Roongprasert, A. Wongkamhang, R. Saosuwan, R. Chotikunnan, P. Imura, A. Nirapai, P. Chotikunnan, M. Sangworasil, and A. Srisirawat, "Exploring ResNet-18 Estimation Design through Multiple Implementation Iterations and Techniques in Legacy Databases," *Journal of Robotics and Control (JRC)*, vol. 4, no. 5, pp. 650-661, 2023, doi: <https://doi.org/10.18196/jrc.v4i5.19589>.

P. Imura, P. Bunchu, P. Chotikunnan, A. Nirapai, A. Wongkamhang, and R. Chotikunnan, "Development of a System for Transmitting Medical Data and Diagnostic Images via the Internet for Hospitals in Thailand," *International Journal of Membrane Science and Technology*, vol. 10, no. 3, pp. 2684-2694, 2023, doi: <https://doi.org/10.15379/ijmst.v10i3.2021>.

R. Chotikunnan, K. Roongprasert, P. Chotikunnan, P. Imura, M. Sangworasil, and A. Srisirawat, "Robotic Arm Design and Control Using MATLAB/Simulink," *International Journal of Membrane Science and Technology*, vol. 10, no. 3, pp. 2448-2459, 2023, doi: <https://doi.org/10.15379/ijmst.v10i3.1974>.

A. Wongkamhang, N. Wuttiapan, R. Chotikunnan, K. Roongprasert, P. Chotikunnan, N. Thongpance, M. Sangworasil, and A. Srisirawat, "Design and Develop a Non-Invasive Pulmonary Vibration Device for Secretion Drainage in Pediatric Patients with Pneumonia," *Journal of Robotics and Control (JRC)*, vol. 4, no. 5, pp. 632-642, 2023, doi: <https://doi.org/10.18196/jrc.v4i5.19588>.

R. Chotikunnan, P. Chitikunnan, A. Ma'arif, N. Thongpance, Y. Pitittheeraphab, and A. Srisirawat, "Ball and Beam Control: Evaluating Type-1 and Interval Type-2 Fuzzy Techniques with Root Locus Optimization," *International Journal of Robotics and Control Systems (IJRCS)*, vol. 3, no. 2, pp. 286-303, 2023.

P. Chotikunnan, T. Puttasakul, R. Chotikunnan, B. Panomruttanarug, M. Sangworasil, and A. Srisirawat, "Evaluation of Single and Dual image Object Detection through Image Segmentation using ResNet18 in Robotic Vision Applications," *Journal of Robotics and Control (JRC)*, vol. 4, no. 3, pp. 263-277, 2023.

P. Chotikunnan, and Y. Pitittheeraphab, "Adaptive P Control and Adaptive Fuzzy Logic Controller with Expert System Implementation for Robotic Manipulator Application," *Journal of Robotics and Control (JRC)*, vol. 4, no. 2, pp. 217-226, 2023.

D. Saputra, A. Ma'arif, P. Chotikunnan, and S. N. Rahmadhia, "Design and Application of PLC-based Speed Control for DC Motor Using PID with Identification System and MATLAB Tuner," *International Journal of Robotics and Control Systems (IJRCS)*, vol. 3, no. 2, pp. 233-244, 2023.

P. Chotikunnan, R. Chotikunnan, A. Nirapai, A. Wongkamhang, P. Imura, and M. Sangworasil, "Optimizing Membership Function Tuning for Fuzzy Control of Robotic Manipulators Using PID-Driven Data Techniques," *Journal of Robotics and Control (JRC)*, vol. 4, no. 2, pp. 128-140, 2023.

N. Thongpance and P. Choitkunnan, "Design and construction of electric wheelchair with mecanum wheel," *Journal of Robotics and Control (JRC)*, vol. 4, no. 1, pp. 71-82, 2023.

P. Choitkunnan and R. Choitkunnan, "Dual design PID controller for robotic manipulator application," *Journal of Robotics and Control (JRC)*, vol. 4, no. 1, pp. 23-34, 2023.

### **International journals**

E. Alfian, A. Ma'arif, P. Chotikunnan, and A. Abougarair, "Optimizing Light Intensity with PID Control," *Control Systems and Optimization Letters*, vol. 1, no. 3, pp. 124–131, 2023, doi: <https://doi.org/10.59247/csol.v1i3.38>.

### **International journals indexed in Scopus that are In Press**

M. Kiew-ong-art, P. Chitikunnan, A. Wongkamhang, R. Chotikunnan, A. Nirapai, P. Imura, M. Sangworasil, N. Thongpance, A. Srisiriwat, "Comparative Study of Takagi-Sugeno-Kang and Madani Algorithms in Type-1 and Interval Type-2 Fuzzy Control for Self-Balancing Wheelchairs," *International Journal of Robotics and Control Systems (IJRCS)*, In press, 2023.

### **Thai-Journal Impact Factors (TCI)**

N. Seethikaew, P. Chotikunnan, and J. Supruang, "Innovation development vibrate for drainage secretion of pediatric patients," *Journal of The Royal Thai Army Nurses*, vol. 23, no. 2, pp. 418-427, 2022.

N. Seethikaew, P. Chotikunnan, W. Vongleasagoon, J. Nitipipatkosol, S. Kaewrakmook, and S. Thakhamma, "Effects of using chest vibration innovation on the efficacy of secretion drainage in children with pneumonia," *Songklanagarind Journal of Nursing*, vol. 42, no. 1, pp. 85-96, 2022.

N. Thongpance, T. Kaewgun, A. Wongkamhan, K. Roongprasert, Y. Pititeeraphab, A. Nirapai, and P. Choitkunnan, "Implementation of defibrillator calibrator for working standard," *The International Journal on Applied Biomedical Engineering (IJABME)*, vol. 10, no. 1, pp. 16-23, 2017.

P. Choitkunnan, B. Panomruttanarug, N. Thongpance, M. Sangworasil, and T. Matsuura, "An application of fuzzy logic reinforcement iterative learning control to balance a wheelchair," *The International Journal on Applied Biomedical Engineering (IJABME)*, vol. 10, no. 2, pp. 1-9, 2017.

### **Thai-Journal**

M. Kiewongart, P. Choitkunnan, M. Sangworasil, N. Thongpance, A. Nirapai, A. Wongkamhan, and R. Choitkunnan, "Design of adaptive fuzzy logic control system with expert system for medical robotic application," Thailand Journal of Health Technology, vol. 3, no. 1, pp. 27-35, 2022.

### **International Conference**

M. Kiewongart, M. Sangworasil, P. Chotikunnan, N. Thongpance, and R. Choitkunnan, "Applied system identification to the P matrix for adaptive P controller implementation in robotic arm simulation using Matlab/Simulink," in Proc. RSU International Research Conference, 2022.

M. Sangworasil, P. Chotikunnan, M. Kiewongart, N. Thongpance, and R. Choitkunnan, "The study of reduction in the tracking error of robotic arms using iterative learning control," in Proc. RSU International Research Conference, 2022.

R. Chotikunnan, P. Chotikunnan, T. Puttasakul, M. Sangworasil, T. Matsuura, and N. Thongpance, "A novel technique for 3D printer to create organ 3D model from DICOM file," in Proc. RSU International Research Conference, 2017.

N. Thongpance, P. Chotikunnan, S. Pata, S. Thongked, M. Sangworasil, T. Matsuura, Y. Pititeeraphab, R. Chotikunnan, and J. Dhamaraks, "The application of PID control to robotic head," in Proc. 2017 Biomedical Engineering International Conference (BMEiCON-2017), Hokkaido, Japan, September 2017.

P. Chotikunnan, T. Matsuura, N. Thongpance, M. Sangworasil, M. Pluemchan, T. Wannarat, and A. Teerasoradech, "The design and construction of surrounding control system for the rehabilitative walker using mecanum wheel," in Proc. 2017 Biomedical Engineering International Conference (BMEiCON-2017), Hokkaido, Japan, September 2017.

R. Chotikunnan, M. Sangworasil, P. Chotikunnan, T. Matsuura, and N. Thongpance, "Electric wheelchair simulation from Unity 3D for controller test," in Proc. 2017 Biomedical Engineering International Conference (BMEiCON-2017), Hokkaido, Japan, September 2017.

Y. Pititeeraphab, T. Jusing, P. Chokulranun, N. Thongpance, and Ch. Pintavirooj, "Robot-arm control system using LEAP Motion controller," in Proc. BME-HUST 2016 International Conference on Bio-Medical Engineering, 2016.

P. Chotikunnan, S. Khumlue, M. Sangworasil, T. Matsuura, C. Polpratom, and B. Janoudom, "The application of series Kalman filter based on measurement angle," in Proc. 2016 Biomedical Engineering International Conference (BMEiCON-2016), Laung Prabang, Laos, December 2016.

Y. Pititeeraphab, T. Jusing, P. Chotikunnan, N. Thongpance, W. Lekdee, and A. Teerasoradech, "The effect of average filter for complementary filter and Kalman filter based on measurement angle," in Proc. 2016 Biomedical Engineering International Conference (BMEiCON-2016), Laung Prabang, Laos, December 2016.

### **Conference**

P. Chotikunnan, S. Khumlue, P. Duangpim, N. Thongpance, M. Sangworasil, T. Matsuura, R. Chotikunnan, and R. Chotikunnan, "A design of the intelligent wheelchair," in Proc. 10th Biomedical Engineering Conference (BMECON-2018), King Mongkut's University of Technology North Bangkok (KMUTNB), Thailand, June 2018.

## **Books, Textbooks, and Supplementary Educational Materials**

P. Chotikunnan, "Fundamentals of Intelligent Control," 4th ed., Pathum Thani, Thailand: Rangsit University Press, 2566. ISBN 978-616-421-187-2.

P. Chotikunnan, "Fundamentals of Intelligent Control [E-book]," Pathum Thani, Thailand: Rangsit University Press, 2566. ISBN 978-616-421-188-9.

P. Chotikunnan, "Medical Control Systems and Robots," 3rd ed., Pathum Thani, Thailand: Rangsit University Press, 2566. ISBN 978-616-421-189-6.

P. Chotikunnan, "Medical Control Systems and Robots [E-Book]," Pathum Thani, Thailand: Rangsit University Press, 2566. ISBN 978-616-421-190-2.

P. Chotikunnan, "Microcontroller System Design," Pathum Thani, Thailand: Rangsit University Press, 2562. ISBN 978-616-421-089-9.

P. Chotikunnan, "Microcontroller System Design [E-Book]," Pathum Thani, Thailand: Rangsit University Press, 2562. ISBN 978-616-497-952-9.

## **Work Experiences**

2012-2015 Teaching Assistant, Control System and Instrumentation Engineering, King Mongkut's University of Technology Thonburi. (INC 151, INC 281, INC 351)

2011-2015 Control and Instrumentation Engineer, Bitrast Industrial Technology Research Company Limited.

2009-2015 Training 5 Day for Robot Programming, Samkhok School Pathumthani.

2016 R&D Embedded Applications, Presidium Instruments (Thailand) Ltd.

2016-Present Lecturer, College of Biomedical Engineering

2018- Present R&D Consultant, S.S.Mechatronics Co.,Ltd. and Auto Part Machine Co.,Ltd.

2022- Present Board of Directors, CYY MANAGEMENT CO., LTD.

## Researches: Name, Published Year, Publicize and Investment

### Researches

- 2012-2015 [Group member] (5.4624 million baht), "Train control duplication system and Alstom engine working test," under Thailand Railway Technology Development Institute Project (NSTDA) and budget from National Research Council of Thailand: NRCT.
- 2012-2013 [Group member] (~300 thousand baht), "Develop Tamarind Machine Production," Office of the Permanent Secretary Science.
- 2016-2017 [Group member] (~210 thousand baht), "Oscillating saw machine for Histopathology," Rangsit University.
- 2016-2018 [Vice of Leader Project] (~1.319 million baht), "Electrical Wheelchair Design that is able to change inclination level and automatic balance," National Research Council of Thailand: NRCT.
- 2017-2018 [Vice of Leader Project] (~591 thousand baht), "Genius Electrical Wheelchair Design," Research Institute of Rangsit University.
- 2017-2018 [Leader Project] (~306 thousand baht), "Design Study and Build the Assist Automatic Walking Equipment," Research Institute of Rangsit University.
- 2017-2018 [Project Consultant] (~4.547 million baht), "Increase people with Hearing Impairment Ability Media Development in daily by Android system process," Educational Promotion and Development Fund for Handicapped.
- 2018-2019 [Vice of Leader Project] (~125 thousand baht), "A study on the design and construction of the robotic arm device imitates movement in the human arm," Research Institute of Rangsit University.
- 2018-2019 [Group member] (~4.370 million baht), "Propel Medical Devices Research for build commercial value," Department of Industry Promotion, Ministry of Industry.
- 2018-2019 [Leader Project] (~125 thousand baht), "Design chest vibrate innovation for drainage secretion of pediatric patient and older person," Research Institute of Rangsit University.
- 2019-2020 [Vice of Leader Project] (~6.505 million baht), "Omni Directional Assistive Electric Wheelchair," National Research Council of Thailand: NRCT.
- 2023-2024 [Leader Project] (~266 thousand baht), "Development of mini Scara robots commanded by Matlab program for the study of control system theory," Academic Services Center, Rangsit University.

## Training and Glorious Biography

The Excellently of Research, “The Application of Fuzzy Logic Control to Balance a Wheelchair,” The 40th Anniversary of Graduate School of Srinakharinwirot University, 2014.

Background/Foreground and RTOS on Microcontroller, Advanced Technology Center for Manufacturing Advanced Technology, King Mongkut 's University of Technology Thonburi, 2013.

Promodel, Advanced Technology Center for Manufacturing Advanced Technology, King Mongkut 's University of Technology Thonburi, 2013.

Joint Workshop for Global Engineers in Asia 2014 Hosted by University Teknologi Malaysia, 2014.

Quality Youth Hall of the Year 2010, Foundation of Science and Technology Council of Thailand, 2010.

Host of Pre BME-Camp [3 Day], Rangsit University, 2017-2018.

Host of Res BME Camp [4 Month], Rangsit University, 2017-2018.

Host of Sumo Robot Camp 1-12 [5 Day], Pathumwan Institute of Technology, 2008-2014.

Medical Devices and Robotics Design by Hyper work program, Workshop and Case Study, 2016.

Academic Service, Mission Hospital, Patong Hospital, 2016.

Medical Devices Innovation Development Tanning 4.0, supported by Department of Industry Promotion, 2016.

Strategy and Research Planning Conference for build innovation and propel Thailand policy 4.0, Digital Group, Internet of Thing and Robot Group and Automatic System Group, 2016.

First Prize, The Best Poster Award, RSU National &International Conference 2017, Poster Contest and International Research Presentation, Medicine and Health Science Group, 2017.

Innovation Award in Best Level, Project Name is “The Rehabilitative Walker Using Mecanum Wheel Direction” in Thailand Research Expo 2017, National Research Council of Thailand: NRCT, 2017.

Assessor Program Training, Thailand Professional Qualification Institute

Develop People, Develop Nation Convention by Personal International Standard System, Thailand Professional Qualification Institute

General Regulation for Authorize Personnel through ISO/IEC 17024 Standard Training, Thailand Professional Qualification Institute

Honorable Mention Award, Medical Device Inno Awards 2018, Project Name is “Surround Electrical Wheelchair Direction by Macanum wheels, Plastic Institute, 2018.

Creative Award, Medical Device Inno Awards 2018, Project Name is “Vibrate Lung Machine to dissolve phlegm, Plastic Institute, 2018.

First Prize, Robot Technology for Ageing Care, MDA Congress, Project Name is “Wheelchair Robot to Assist Disabled, Thai Biomedical Engineering Research Association, 2018.

Petchra Pra Jom Klao Research Scholarship Academic Year 2018, King Mongkut's University of Technology Thonburi

Innovation Award in Best Level and Gold, Project Name is “Intelligent Wheelchair Direction” in Thailand Research Expo 2018, National Research Council of Thailand: NRCT, 2018.

The Best Poster Award, Project Name is “Intelligent Wheelchair Direction” in Thailand Research Expo 2018, National Research Council of Thailand: NRCT, 2018.