

2019 First International Symposium on Instrumentation, Control, Artificial Intelligence, and Robotics (ICA-SYMP 2019)

**Bangkok, Thailand
16-18 January 2019**



**IEEE Catalog Number: CFP19R12-POD
ISBN: 978-1-5386-7775-9**

**Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP19R12-POD
ISBN (Print-On-Demand):	978-1-5386-7775-9
ISBN (Online):	978-1-5386-7774-2

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Table of Contents

2019 ICA-SYMP Committee	ii
Adaptive Fuzzy-Neural-Network Control Scheme for an Active Power Filter Using Fuzzy Backstepping Approach	1
<i>Juntao Fei, Yunmei Fang and Tengeng Wang</i>	
Human-to-Robot Object Handover using a Behavioural Position-based Force Control Approach	5
<i>Paramin Neranon</i>	
Features and Window Size Selection for Quadcopter Control Using Functional Near-Infrared Spectroscopy	9
<i>Amad Zafar, Usman Ghafoor, M. Atif Yaqub and Keum-Shik Hong</i>	
Performance Comparison of Compliance Control based on PI and FLC for Safe Human-robot Cooperative Object Carrying.....	13
<i>Prakarn Jaroonsorn, Paramin Neranon, Charoenyut Dechwayukul and Pruittikorn Smithmaitrie</i>	
A Method of 3D Hand Movement Recognition by a Leap Motion Sensor for Controlling Medical Image in an Operating Room	17
<i>Phataratah Sa-Nguannarm, Theekapun Charoenpong, Chamaporn Chianrabutra and Kraiyot Kiatsoontorn</i>	
Design of a Disturbance Observer for a Force Sensation Task of a Control Moment Gyroscope	21
<i>Sang Lee and Seul Jung</i>	
A New Tracking Control Algorithm for a Wheeled Mobile Robot Based on Backstepping and Hierarchical Sliding Mode Techniques.....	25
<i>Sen Pham Thi Huong, Nguyen Quang Minh, Do Thi Tu Anh, and Phan Xuan Minh</i>	
Human Edge Segmentation From 2D Images By Histogram of Oriented Gradients and Edge Matching Algorithm	29
<i>Phakjira Sombatpiboonporn, Theekapun Charoenpong, Ajaree Supasuteekul, Chamaporn Chianrabutra and Kanjana Pattanaworapan</i>	
Temperature Observation Inside a Heating Slab via Fuzzy-Galerkin Approximation	33
<i>Nguyen Viet Dung, Do Thi Tu Anh and Nguyen Doan Phuoc</i>	
Full-Bridge Converter with Wide ZVS Range, Low Circulating Current and Wide Hold-Up Time	37
<i>Bor-Ren Lin, Kai-Wei Wang, and Jheng-Jie Dai</i>	
Experiment on Real-Time Image Processing in the Controlling of Mecanum Wheel Robotic Car.....	41
<i>Aung San Oo, Min Yan Naing, Itthisek Nilkhamhang and Thida Than</i>	
Development of Computer Vision-Based Movement Controlling in Mecanum Wheel Robotic Car.....	45
<i>Min Yan Naing, Aung San Oo, Itthisek Nilkhamhang and Thida Than</i>	

Identification of Wiener- Hammerstein Cascaded System Using Hybrid Backtracking Search Algorithm with Wavelet Mutation	49
<i>Kashyap Mattoo, Parthasarathi Pal, Rajib Kar, Durbadal Mandal, and Saktiprasad Ghoshal</i>	
Appliance Classification method based on K-Nearest Neighbors for Home Energy Management System	53
<i>Thanh Dat Nguyen, Truong Dong Do, My Ha Le, Ngoc Thien Le and Watit Benjapolakul</i>	
A Robus Method for Wheelchair Detection: a Combination of the Gaussian Mixture Models and Histogram of Oriented Gradients	57
<i>Sirintip Hirunwattanakun, Theekapun Charoenpong, Chamaporn Chianrabutra and Theerasak Chanwimalueng</i>	
A Method of Driver's Eyes Closure and Yawning Detection for Drowsiness Analysis by Infrared Camera	61
<i>Wisaroot Tipprasert, Theekapun Charoenpong, Chamaporn Chianrabutra and Chamaiporn Sukjamsri</i>	
Automatic Altitude Control of Multirotor Aircraft with Consideration of Motion	65
<i>Annop Ruangwiset</i>	
C4.5 Decision Tree against Neural Network on Gait Phase Recognition for Lower Limb Exoskeleton	69
<i>Akamin Thongsook, Theerathep Nunthawarasilp, Pachara Kraypet, Jirapong Lim and Niramom Ruangpayoongsak</i>	
Nonlinear Nature of Incandescent Lamp: An Experimental Investigation	73
<i>Yogesh Rohilla and Dinesh Kumar</i>	
Pitch Attitude Hold Autopilot for YTU EC-001 Fixed-Wing Unmanned Aerial Vehicle ...	78
<i>Thanda Win, Hteik Tin Cho Nyunt and Hla Myo Tun</i>	
Modeling and Integral Hierarchical Sliding-Mode Control for 2D Ship-mounted Crane	82
<i>Nguyen Van Thai, Le Viet Anh, Pham Tien Dung , Vo Hoang Thuat , Pham Quang Truong and Ha Thi Kim Duyen</i>	
Short-Term Load Forecast for Energy Management Systems Using Time Series Analysis and Neural Network Method with Average True Range	86
<i>Tanwalai Panapongpakorn and David Banjerdpongchai</i>	
Development of Autonomous Mobile Robot Platform with Mecanum Wheels	90
<i>Kanin Piemngam, Itthisek Nilkhamhang and Pished Bunnun</i>	
A Case Study of EV Control on Slip Surface based on Driving Force Distribution and Hierarchical LQR	94
<i>Pattanun Srisukanun and Itthisek Nilkhamhang</i>	
Pitch Control of an Active Omni-wheeled Unicycle using LQR	98
<i>Sudarshan M Samarasinghe and Manukid Parnichkun</i>	
Robust H-infinity Control of Robotic Systems with Parametric Uncertainties based on LMI Pole-Placement	102
<i>Surathep Nilnond, Natthawut Chinthaned and Peerayot Sanposh</i>	

Pitch Balancing Control of a Flipping Two-Wheel Stair Climbing Robot	106
<i>Bhashitha Channa Widana Gamage and Manukid Parnichkun</i>	
Neural Network based Model Reference Control for Electric Heating Furnace with Input Saturation	111
<i>Nam Nguyen and Dat Tran</i>	
Trajectory Tracking Control Design for Dual-Arm Robots Using Dynamic Surface Controller.....	115
<i>Huu Nguyen Thai, Anh Tuan Phan, Cong Khoa Nguyen, Quang Uoc Ngo, Phong Tuyen Dinh and Quoc Truong Vo</i>	
Spatio-temporal Model for Limit Order Books in The Stock Exchange of Thailand.....	119
<i>Khirkorn Thipprachak and Poj Tangamchit</i>	
Navigation Control of an Automatic Guided Forklift.....	123
<i>Dayantha Ilangasinghe and Manukid Parnichkun</i>	
Trajectory Tracking Control for Omnidirectional Mobile Robots using Direct Adaptive Neural Network Dynamic Surface Controller.....	127
<i>Ha Thi Kim Duyen, Ngo Manh Tien, Pham Duc Tuan and Pham Van Bach Ngoc</i>	
Trajectory Tracking Control for Four-Wheeled Omnidirectional Mobile Robot using Backstepping Technique Aggregated with Sliding Mode Control	131
<i>Kim Duyen Ha Thi, Manh Cuong Nguyen, Hoang Thuat Vo, Van Manh Tran, Duc Dinh Nguyen and Anh Dung Bui</i>	
Underwater Computer Vision of the ZEABUS AUV	135
<i>Supakit Kriangkajorn, Akrapong Patchararungruang and Somchai Numprasertchai</i>	
3-D Mapping and Localization using RGB-D Camera.....	139
<i>Noppadol Pudchuen and Wisanu Jitviriya</i>	
Development of ZEABUS 2018 AUV	143
<i>Vasutorn Siriyakorn, Akrapong Patchararungruang, Peerayot Sanposh, Yodyium Tipsuwan, Chinoros Nakthewan, Supakit Kriangkajorn and Natchanan Thongtem</i>	
Grasping with a Tube-Feet Inspired Soft Gripper.....	147
<i>Pasit Jittungboonya and Thavida Maneewarn</i>	
ROS based Autonomous Mobile Robot Navigation using 2D LiDAR and RGB-D Camera .	151
<i>Sukkpranhachai Gatesichapakorn, Jun Takamatsu and Miti Ruchanurucks</i>	
Development of a Semi Auto-Tuning Algorithm for PI+CI Reset Controller	155
<i>Jidapa Doktian, Witthawas Pongyart and Pisit Vanichchanunt</i>	
Automatic Sampling Time Adaptation for Networked Digital Controller based-on Embedded System	159
<i>Nattakan Prempreechakun, Santi Nuratch and Panuthat Boonpramuk</i>	
Wheel Slip Angle Estimation of a Planar Mobile Platform.....	163
<i>Ronnapee Chaichaowarat and Witaya Wannasuphprasit</i>	
A Study on Automatic Flaw Detection using MSSIM in Ultrasound Imaging of Steel Plate	167
<i>Worawit Padungsriborworn, Natee Thong-Un and Weerachon Treenuson</i>	

Control System Design of Power Asssted Bike Based on Planetary Gear	171
<i>Chun-Lin Chen, Chun-Chin Wang, Mi-Ching Tsai and Po-Jen Ko</i>	
A Comparative Study on Model-Free Valve Stiction Compensation Methods.....	175
<i>Rossukon Kasikijvorakul and Sarawan Wongsra</i>	
Four Steps Methods for Designing a State Feedback Controller for a System with Markov Delay.....	179
<i>Janghoon Yang</i>	
The Chicken's Legs Size Classification Using Image Processing and Deep Neural Network.	183
<i>Thaksin Sangsuwan and Wittaya Koodtalang</i>	
Anti-impact Trajectory Generation for a Humanoid Robot	187
<i>Pramin Artrit, Tanyasit Numkiatanan and Nattapong Nernchad</i>	
Design of State Feedback Traffic Control Using Hierarchical Distributed Control Framework.....	191
<i>Jeerapat Jitnuant and David Banjerdpongchai</i>	
Wind Disturbance Control for V-tail Y-Shape Quadcopter.....	195
<i>Shawndy Michael Lee Jin Lun, Sarul Sakulthong, and Sutthiphong Srigrarom</i>	
Analysis of Grass Area Aerial Image Set.....	203
<i>Yap Zhan Hong, Lee Meng Da, Cheong Kah Yuen, and Sutthiphong Srigrarom</i>	
Development of UGS-TUM Vertical Take Off & Landing (VTOL) Drone with Flight Control.....	213
<i>Andre Novianto Wan, Glendon Mao Shen Sim, Ryan Wee Lun Koh, Ryan Kok Fong Koh, Gibson Tubiba Teo, Thian Hong Yap, Tin Nilju, Sutthiphong Srigrarom, Florian Holzapfel, Valentin Marvakov, Pranav Bhadwaj, Suradet Tantrairatn, and Sarul Sakulthong</i>	
Comparison of Step Length Estimation Models using Inertial Sensor on Pelvis	222
<i>Daehyun Kim, Hojin Ju and Chan Gook Park</i>	
Multi-Target Tracking Based on Gaussian Mixture Labeled Multi-Bernoulli Filter with Adaptive Gating.....	226
<i>Woo Jung Park and Chan Gook Park</i>	
A Control Strategy for DC Smart Grids Operation.....	230
<i>Hamed Yahoui, Hoang-Giang Vu, Thi-Thuong-Huyen Ma and Thanh-Kha Tran</i>	
Author Index	234