# Table of Contents

<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection Model of Invisible Weld Defects Using Magneto-Optical Imaging Induced by Rotating Magnetic Field</td>
<td>1</td>
</tr>
<tr>
<td>Yanfeng Li, Xiangdong Gao, Yanxi Zhang, Deyong You, Congyi Wang, Yaowu Song, Nanfeng Zhang</td>
<td></td>
</tr>
<tr>
<td>Study on Workpiece and Welding Torch Height Control for Polydirectional WAAM by Means of Image Processing</td>
<td>6</td>
</tr>
<tr>
<td>Uwe Reisgen, Samuel Mann, Lukas Oster, Philipp Lozano, Rahul Sharma</td>
<td></td>
</tr>
<tr>
<td>Mosquito Pick-And-Place: Automating a Key Step in PfSPZ-Based Malaria Vaccine Production</td>
<td>12</td>
</tr>
<tr>
<td>Henry Phalen, Prasad Vagdargi, Michael Pozin, Sumana Chakravarty, Gregory Chirikjian, Ioan Iulian Iordachita, Russell H. Taylor</td>
<td></td>
</tr>
<tr>
<td>A Pilot Protection Method Based on Energy Balance for Half-Wavelength Transmission Lines</td>
<td>18</td>
</tr>
<tr>
<td>Jianfeng Fu, Guobing Song, Bart De Schutter</td>
<td></td>
</tr>
<tr>
<td>Development of a Virtual Metering Method for Characterizing Energy Flows in Air Handling Units</td>
<td>24</td>
</tr>
<tr>
<td>Darwish Darwazeh, Burak Gunay, Jean Duquette</td>
<td></td>
</tr>
<tr>
<td>Conditional Value at Risk Based Multidisciplinary Robust Design Optimization</td>
<td>30</td>
</tr>
<tr>
<td>Wei Li, Tong Wang, Mi Xiao, Mingzhu Lai, Liang Gao, Congbo Li</td>
<td></td>
</tr>
<tr>
<td>Real-Time Control for Large Scale Additive Manufacturing Using Thermal Images</td>
<td>36</td>
</tr>
<tr>
<td>Feifan Wang, Feng Ju, Kyle Rowe, Nils Hofmann</td>
<td></td>
</tr>
<tr>
<td>An Accurate and Robust Algorithm for Performance Evaluation of Exponential Serial Lines with Finite Buffers</td>
<td>42</td>
</tr>
<tr>
<td>Yishu Bai, Jiachen Tu, Mengzhuo Yang, Liang Zhang, Peter Denno</td>
<td></td>
</tr>
<tr>
<td>Yunyi Kang, Feng Ju</td>
<td></td>
</tr>
<tr>
<td>Advanced Sensor and Target Development to Support Robot Accuracy Degradation Assessment</td>
<td>54</td>
</tr>
<tr>
<td>Guixiu Qiao</td>
<td></td>
</tr>
<tr>
<td>Modelling a Batch Assorting Operation for an Autonomous Cart in a Parallel-Aisle Order Assorting System</td>
<td>60</td>
</tr>
<tr>
<td>Jeongman Lee, Soondo Hong, Youngjoo Kim</td>
<td></td>
</tr>
<tr>
<td>A Proposed Mapping Method for Aligning Machine Execution Data to Numerical Control Code</td>
<td>66</td>
</tr>
<tr>
<td>Laetitia Monnier, William Bernstein, Sebti Foufou</td>
<td></td>
</tr>
<tr>
<td>Standards for Smart Manufacturing: A Review</td>
<td>73</td>
</tr>
<tr>
<td>Yuqian Lu, Huiyue Huang, Chao Liu, Xun Xu</td>
<td></td>
</tr>
<tr>
<td>Dynamic Bottleneck in Serial Production Lines with Bernoulli Machines</td>
<td>79</td>
</tr>
<tr>
<td>Jiachen Tu, Yishu Bai, Mengzhuo Yang, Liang Zhang, Peter Denno</td>
<td></td>
</tr>
</tbody>
</table>
Energy Consumption Optimization in Two-Machine Bernoulli Serial Lines with Limits on Machine Efficiency
Chao-Bo Yan

Energy Cost Optimization in Two-Machine Bernoulli Serial Lines under Time-Of-Use Pricing
Xingrui Cheng, Chao-Bo Yan, Feng Gao

Real-Time Performance Analysis of Batch-Based Serial Flexible Production Lines with Geometric Machines
Jingchuan Chen, Zhiyang Jia, Yaping Dai

Data-Driven Fault Diagnostics and Prognostics for Predictive Maintenance: A Brief Overview
Gaowei Xu, Min Liu, Jingwei Wang, Yumin Ma, Jian Wang, Fei Li, Weiming Shen

Data Driven Scheduling Knowledge Management for Smart Shop Floor
Yumin Ma, Xiaoyu Lu, Fei Qiao

A Hybrid Multi-Objective Algorithm for Energy-Efficient Scheduling Considering Machine Maintenance
Junxia Xing, Fei Qiao, Hong Lu

Short-Term Load Forecasting Based on Variational Modal Decomposition and Optimization Model
Zhengcai Cao, Lu Liu, Biao Hu, Hongyu Xie

DefectGAN: Weakly-Supervised Defect Detection Using Generative Adversarial Network
Shuanlong Niu, Hui Lin, Tongzhi Niu, Bin Li, Xinggang Wang

Data-Driven Decision-Support for Process Improvement through Predictions of Bed Occupancy Rates
Kar Way Tan, Qi You Ng, Ngoc Hoang Long Nguyen, Lam Shao Sean

SEMG-Based Continuous Estimation of Knee Joint Angle Using Deep Learning with Convolutional Neural Network
Geng Liu, Li Zhang, Bing Han, Tong Zhang, Zhe Wang, Pingping Wei

HMC: A Hybrid Reinforcement Learning Based Model Compression for Healthcare Applications
Ravi Soni, Jiahui Guan, Gopal Avinash, V Ratna Saripalli

Physics-Based Deep Spatio-Temporal Metamodelling for Cardiac Electrical Conduction Simulation
Hao Yan, Xinyu Zhao, Zhiyong Hu, Dongping Du

A Method for Self-Service Rehabilitation Training of Human Lower Limbs
Zhaowen Shao, Lingtao Yu, Jun Li

An Intelligent Action Recognition System to Assess Cognitive Behavior for Executive Function Disorder
Ashwin Ramesh Babu, Mohammad Zakizadeh, James Robert Brady, Diane Calderon, Fillia Makedon

Automated Extraction of Surgical Needles from Tissue Phantoms
Priya Sundaresan, Brijen Thananjeyan, Johnathan Chiu, Danyal Fer, Ken Goldberg

Optimal Budget Allocation in Simulation Analytics
Xiao Jin, Haobin Li, Loo Hay Lee

Task Scheduling with Nonlinear Costs Using SMT Solvers
Mohammad Hekmatnejad, Giulia Pedrielli, Georgios Fainekos

Supervisory Control in Partially Observable Petri Nets with Sensor Reduction
Ziyue Ma, Zhou He, Zhiwu Li

No Synthesis Needed, We Are Alright Already
Martijn Goorden, Martin Fabian

Active Diagnosis of Petri Nets Using Q-Diagnoser
Yihui Hu, Ziyue Ma, Zhiwu Li

Modeling and control of prosumer-based microgrids: a Petri net approach
Lia Strenge, Germano Schafaschek, Jörg Raisch

Process Mining of Programmable Logic Controllers: Input/output Event Logs
Julian Theis, Ilia Mokhtarian, Houshang Darabi

An Inquiry into the Predictability of Failure Events in Chillers and Boilers
Burak Gunay, Zixiao Shi, Chunsheng Yang, Weiming Shen, Darwizh Darwazeh

A Deep Learning Approach for Heating and Cooling Equipment Monitoring
Yunli Wang, Chunsheng Yang, Weiming Shen

Railway Joint Detection Using Deep Convolutional Neural Networks
Yanmin Sun, Yan Liu, Chunsheng Yang

Adversarial Grasp Objects
David Wang, David Tseng, Pusong Li, Yiding Jiang, Jeffrey Mahler, Ken Goldberg, Menglong Guo, Michael Danieleczuk, Jeffrey Ichnowski

Mean Spectral Normalization of Deep Neural Networks for Embedded Automation
Anand Krishnamoorthy Subramanian, Nak Young Chong

Constructive Policy: Reinforcement Learning Approach for Connected Multi-Agent Systems
Sayyed Jaffar Ali Raza, Mingjie Lin

A Labor-Efficient GAN-Based Model Generation Scheme for Deep-Learning Defect Inspection among Dense Beans in Coffee Industry
Cheng-Ju Kuo, Chao-Chun Chen, Tzu-Ting Chen, ZhiJing Tsai, Min-Hsiung Hung, Yu-Chuan Lin, Yi-Chung Chen, Ding-Chau Wang, Gwo-Jiun Horng, Wei-Tsung Su

Parameters Identification of a Five-Axis Machine Tool by Haar Wavelet
Shyh-Leh Chen, Apisit Pinitnanthakorn

Data-Driven Surgical Duration Prediction Model for Surgery Scheduling: A Case-Study for a Practice-Feasible Model in a Public Hospital
A Variable Neighborhood Search for Home Care Scheduling under Chargeable Overtime and Preference Matching

Yanran Zhu, Andrea Matta, Ettore Lanzarone, Na Geng

Evaluation of E-Consults in Healthcare Delivery

Aditya Mahadev Prakash, Qiaochu He, Xiang Zhong

Enhancing Digital Twins through Reinforcement Learning

Constantin Cronrath, Bengt Lennartson, Abolfazl R. Aderiani

A Shapelet Dictionary Learning Algorithm for Time Series Classification

Jitao Zhang, Xinyu Li, Liang Gao, Long Wen, Guokai Liu

Fault Diagnosis Using Unsupervised Transfer Learning Based on Adversarial Network

Zhao Zhang, Xinyu Li, Long Wen, Liang Gao, Yiping Gao

Image-Based Process Monitoring Via Adversarial Autoencoder with Applications to Rolling Defect Detection

Hao Yan, Huai-Ming Yeh, Nurettin Sergin

Remaining Useful Life Estimation Based on a New Convolutional and Recurrent Neural Network

Xinyun Zhang, Yan Dong, Long Wen, Fang Lu, Wei Li

Data Mining Methods to Analyze Alarm Logs in IoT Process Control Systems

Aldo Dagnino

An Improved Q-Learning Based Rescheduling Method for Flexible Job-Shops with Machine Failures

Meng Zhao, Xinyu Li, Liang Gao, Ling Wang, Mi Xiao

A Cuckoo Search-Based Scheduling Algorithm for a Semiconductor Production Line with Constrained Waiting Time

Lijie Zhou, Chengran Lin, Biao Hu, Zhengcai Cao

Minimizing total flow time in two-stage hybrid flowshop with parallel machines and a single batching machine

Hua Gong, Xiaojuan Shu, Fang Liu*, and Ke Xu

An Iterated Greedy Algorithm for Distributed Hybrid Flowshop Scheduling Problem with Total Tardiness Minimization

Jing-jing Wang, Ling Wang

Research on the Development Approach of Regional Manufacturing Industry in Internet+ Era

Zhengxuan Jia, Yingying Xiao, Guoqiang Shi, Tingyu Lin, Mei Wang, Zhen Shen

Data-Driven Manufacturing Service Optimization Model in Smart Factory

Wei Wu, Jianfeng Lu, Hao Zhang
A New Spectral Clustering Based on Particle Swarm Optimization for Unsupervised Fault Diagnosis of Bearings

Wenbin Song, Mingzhu Lai, Xinyu Li, Yanan Song, Liang Gao

A Screen-Based Method for Automated Camera Intrinsic Calibration on Production Lines

Wenliang Gao, Jiarong Lin, Fu Zhang, Shaojie Shen

Random Forest Modeling for Survival Analysis of Cancer Recurrences

Farhad Imani, Ruimin Chen, Conrad Tucker, Hui Yang

Model Identification and Physical Exercise Control Using Nonlinear Heart Rate Model and Particle Filter

Dongping Du, Zhiyong Hu, Yuncheng Du

Multi-Mosquito Object Detection and 2D Pose Estimation for Automation of PfSPZ Malaria Vaccine Production

Hongtao Wu, Jiteng Mu, Da Ting, Mengdi Xu, Russell H. Taylor, Ioan Iulian Iordachita, Gregory Chirikjian


Ashkan Sharabiani, Adam Bress, William Galanter, Rezvan Nazempour, Houshang Darabi

Screening a Portfolio of Pathologies by Subject Profiling and Medical Test Rationing

Nilson Herazo-Padilla, Vincent Augusto, Bienvenu Bongue, Benjamin Dalmas, Xiaolan Xie

Task-Space Position and Containment Control of Redundant Manipulators with Bounded Inputs

Amir Zakerimanesh, Ali Torabi, Farzad Hashemzadeh, Mahdi Tavakoli

Neural-Network-Based Heart Motion Prediction for Ultrasound-Guided Beating-Heart Surgery

Lingbo Cheng, Mahdi Tavakoli

Mosquito Staging Apparatus for Producing PfSPZ Malaria Vaccines

Mengdi Xu, Shengnan Lyu, Yingtian Xu, Can Kocabalkanli, Brian Chirikjian, John Chirikjian, Joshua Davis, Jin Seob Kim, Ioan Iulian Iordachita, Russell H. Taylor, Gregory Chirikjian

Real-Time Validation of Digital Models for Manufacturing Systems: A Novel Signal-Processing-Based Approach

Giovanni Lugaresi, Gianluca Aglio, Federico Folgheraiter, Andrea Matta

Simulation Based Energy Optimization of Robot Stations by Motion Parameter Tuning

Mattias Hovgard, Bengt Lennartson, Kristofer Bengtsson
PredNet and CompNet: Prediction and High-Precision Compensation of In-Plane Shape Deformation for Additive Manufacturing

Zhen Shen, Xiuqin Shang, Yuqing Li, Yin Bao, Xipeng Zhang, Xisong Dong, Li Wan, Gang Xiong, Feiyue Wang

A New Solution Approach for Flow Shop Scheduling with an Exponential Time-Dependent Learning Effect

Lingxuan Liu, Hongyu He, Leyuan Shi

On Consistent Reduction in Discrete-Event Systems

Kai Cai, Alessandro Giua, Carla Seatzu

Supervisory Control for Delayed Detectability of Discrete Event Systems

Xiang Yin, Shaoyuan Li

Computational Effort of BDD-Based Supervisor Synthesis of Extended Finite Automata

Sander Thuijsman, Dennis Hendriks, Rolf Theunissen, Michel Reniers, Ramon Schiffelers

Supervisory Control of Discrete-Event Systems in an Asynchronous Setting

Aida Rashidinejad, Michel Reniers, Martin Fabian

Synthesis of Supervisors for Unknown Plant Models Using Active Learning

Ashfaq Hussain Farooqui, Martin Fabian

Finite Response and Confluence of State-Based Supervisory Controllers

Ferdie Reijnen, Albert Hofkamp, Joanna Maria Van de Mortel-Fronczak, Michel Reniers, Jacobus E. Rooda

Improved Production Performance through Manufacturing System Learning

Yu Qian, Jorge Arinez, Guoxian Xiao, Qing Chang

Machine Preventive Replacement Policy for Serial Production Lines Based on Reinforcement Learning

Jing Huang, Qing Chang, Nilanjnan Chakraborty

A Methodology for the Early Diagnosis of Vehicle Torque Converter Clutch Degradation

Xiaodong Jia, Shiming Duan, Chunhao Lee, Peter Radecki, Jay Lee

Conflict Resolution for Heterogeneous Teams in Communication-Limited Environments: A Generous Agent Approach

Demetrious T. Kutzke, Matthew Bays

Set-Based Predictive Control for Collision Detection and Evasion

Jeremy Crowley, Yegeta Zeleke, Berk Altin, Ricardo Sanfelice

Selecting the Optimal System Design under Covariates

Siyang Gao, Jianzhong Du, Chun-Hung Chen

Improving the Generalizability of Robot Assembly Tasks Learned from Demonstration Via CNN-Based Segmentation

Iñigo Iturrate, Etienne Roberge, Esben Hallundbæk Østergaard, Vincent Duchaine, Thiusius Rajeeth Savarimuthu
Tool-center-point control of a flexible link concrete pump with hydraulic limitations using quadratic programming

Julian Wanner, Oliver Sawodny

Iterated Local Search for Steelmaking–refining–Continuous Casting Scheduling Problem

Kunkun Peng, Liang Gao, Ling Wang, Xudong Deng, Quan-ke Pan, Congbo Li

Green Job Shop Scheduling Problem with Machine at Different Speeds Using a Multi-Objective Grey Wolf Optimization Algorithm

Yuesheng Luo, Chao Lu, Xinyu Li, Ling Wang, Liang Gao

A Novel Grammatical Evolution Algorithm for Automatic Design of Scheduling Heuristics

Yifei Teng, Shaofeng Du, Zhenjun Hong, Xuhui Wu, Yunna Tian, Dongni Li

Energy Saving Scheduling of a Single Machine System Based on Bi-Objective Particle Swarm Optimization

Junfeng Wang, Min Qian, Lingui Hu, Shiqi Li, Qing Chang

Energy Consumption Optimization in Three-Machine Bernoulli Serial Lines

Chao-Bo Yan, Ziqian Zheng

Energy Efficient State Control of Machine Tools: A Time-Based Dynamic Control Policy

Lorenzo Marzano, Niela Frigerio, Andrea Matta

An Adaptive Interval Forecast CNN Model for Fault Detection Method

Junjie He, Junliang Wang, Lu Dai, Jie Zhang, Jinsong Bao

Damage Detection of Building Structure Based on Vibration Data and Hysteretic Model

Jesús Morales Valdez, Mario Antonio Lopez Pacheco, Wen Yu

Design of a Horizontal Data Fragmentation, Allocation and Replication Method in the Cloud

Felipe Castro-Medina, Lisbeth Rodríguez-Mazahua, Asdrubal López-Chau, Isaac Machorro-Cano, Maria Abud-Figueroa

An Improved GA-KRR Nested Learning Approach for Refrigeration Compressor Performance Forecasting

Chuqiao Xu, Xin Liu, Junliang Wang, Jie Zhang, Jin Cao, Wei Qin

Measure Community Quality by Attribute Importance and Density in Social Networks

Xiaoou Li, Bella Martinez-Seis, Xizhao Wang

A Framework for Accurate Time Series Classification Based on Partial Observation

Fazle Karim, Houshang Darabi, Samuel Harford, Shun Chen, Anooshirvan Sharabiani

Investigation of Deep Learning for Real-Time Melt Pool Classification in Additive Manufacturing

Zhao Yang, Yan Lu, Ho Yeung, Sundar Krishnamurty

Machine Learning Based Continuous Knowledge Engineering for Additive Manufacturing

Hyunwoong Ko, Yan Lu, Paul Witherell, Ndeye Yande Clarisse Ndiaye
Iterative Learning Control for Power Profile Shaping in Selective Laser Melting
Aleksandr Shkoruta, William Caynoski, Sandipan Mishra, Stephen Rock

Spray Pattern Analysis Using Wet-Mix Concrete for Model Based Process Control towards Automated Construction
Benjamin Schuler, Oliver Sawodny

Nonlinear Deformation Prediction and Compensation for 3D Printing Based on CAE Neural Networks
Meihua Zhao, Gang Xiong, Zhen Shen, Xiuqin Shang, Chang Liu, Huaiyu Wu

SMT Solvers for Flexible Job-Shop Scheduling Problems: A Computational Analysis
Sabino Francesco Roselli, Kristofer Bengtsson, Knut Akesson

Machine Learning Approach for Identification of Objective Function in Production Scheduling Problems
Yoki Matsuoka, Tatsushi Nishi, Kevin Tierney

Multi-Level Lot-Streaming Production Planning with the Objective of Workload Balancing
Weihao Wang, Leyuan Shi

Simulated Annealing for the Multi-Vehicle Cyclic Inventory Routing Problem
Aldy Gunawan, Audrey Tedja Widjaja, Vincent F. Yu, Pieter Vansteenwegen

Multi-Objective Optimization for Work-In-Process Balancing and Throughput Maximization in Global Fab Scheduling
Félicien Barhebwa-Mushamuka, Stephane Dauzere-Peres, Claude Yugma

Plan instability prediction by machine learning in master production planning
Tim Lauer, Sarah Legner

Design of Video-Based Clinical Visits with Nurse Assistant for Chronic Diseases Management
Xiaojie Wang, Yongpei Guan, Xiang Zhong

Optimizing Outpatient Department Staffing Level Using Multi-Fidelity Models
Bowen Pang, Xiaolei Xie, Bernd Heidergott, Yijie Peng

Optimizing a UAV-Based Emergency Medical Service Network for Trauma Injury Patients
Ruijiu Mao, Bin Du, Dengfeng Sun, Nan Kong

An Approach for Behavioral Drift Detection in a Smart Home
Cyriac Azefack, Raksmeay Phan, Vincent Augusto, Guillaume Gardin, Claude Montuy Coquard, Remi Bouvier, Xiaolan Xie

Optimal Coordination of EVs and HVAC Systems with Uncertain Renewable Supply
Haoming Zhao, Zhanbo Xu, Jiang Wu, Kun Liu, Lei Yang, Xiaohong Guan

A Model-Driven Learning Approach for Predicting the Personalized Dynamic Thermal Comfort in Ordinary Office Environment
Yadong Zhou, Xukun Wang, Zhanbo Xu, Ying Su, Ting Liu, Chao Shen, Xiaohong Guan
A Multi-Stage Dispatching and Scheduling Algorithm for Individualized Public Transportation System  
Zhenming Yang, Xuetao Wang, Chenghao Li, Qianchuan Zhao  
Blockchain-Enabled Workflow Management System for Fine-Grained Resource Sharing in E-Commerce Logistics  
Ming Li, George Q. Huang  
A Decentralized State Estimation Algorithm for Building Electrical Distribution Network Based on ADMM  
Yuhan Zhang, Jianchun Xing, Qizhen Zhou, Shiqiang Wang  
O-LoMST: An Online Anomaly Detection Approach and Its Application in a Hydropower Generation Plant  
Imtiaz Ahmed, Travis Galoppo, Yu Ding  
Enhancing Random Search with Surrogate Models for Lipschitz Continuous Optimization  
Qi Zhang, Jiaqiao Hu  
Integrating Heuristics and Approximations into a Branch and Bound Framework  
Zelda Zabinsky, Ting-Yu Ho, Hao Huang  
Bridging the Gap between Semantics and Control for Industry 4.0 and Autonomous Production  
Bernd Kast, Sebastian Albrecht, Wendelin Feiten, Jianwei Zhang  
Human-In-The-Loop Control Synthesis for Multi-Agent Systems under Hard and Soft Metric Interval Temporal Logic Specifications  
Sofie Ahlberg, Dimos V. Dimarogonas  
CMAC-Adaptive Force-Position Control of a Flexible-Joint Robot  
Samuel Doctolero, Chris Macnab  
Fuzzy Back-Stepping Controller for Fixed-Trim Reentry Vehicle Considering Input Constraint  
Guanlin Li, Tao Chao, Songyan Wang, Ming Yang  
Passivity-Based Cascade Hybrid Pose/Force Robot Control  
Rodolpho Ribeiro, Liu Hsu, Ramon Costa, Fernando Lizarralde  
An Adaptive Wordpiece Language Model for Learning Chinese Word Embeddings  
BinChen Xu, Lu Ma, HaoHai Li, Qi Kang, MengChu Zhou, Liang Zhang  
Design a DC Solid-State Circuit Breaker for Smart Grid Application  
Ming-Tsung Tsai, Ching-Lung Chu, Bo. Wei Huang, Chang-Hua Lien, Kuei-Hsiang Chao  
A Digital Twin Framework for Performance Monitoring and Anomaly Detection in Fused Deposition Modeling  
Efe Balta, Dawn Tilbury, Kira Barton  
A Transferable Force Controller Based on Prescribed Performance for Contact Establishment in Robotic Assembly Tasks  
Lorenz Halt, Fengjunjie Pan, Thomas Seel, Philipp Tenbrock, Andreas Pott
Cost calculation model for reconfigurable, hybrid assembly systems
Manuel Fechter, Thomas Dietz and Thomas Bauernhansl

Bayesian Stackelberg Game Model for Water Supply Networks against Bounded Rational Interdictors
Jing Jiang, Xiao Liu

A Survivability-Aware Cyber-Physical Systems Design Methodology
Nafiul Rashid, Gustavo Quiros, Mohammad Abdullah Al Faruque

Deep Learning Based Efficient Anomaly Detection for Securing Process Control Systems against Injection Attacks
Sasanka Potluri, Christian Diedrich

Reaction Temperature Estimation in Shell Coal Gasification Process
Kangcheng Wang, Chao Shang, Fan Yang, Yongheng Jiang, Dexian Huang

Algorithm for Power Stabilization in Rotary Drilling Systems
Maksim Faronov, Ilia G. Polushin

Learning Deep Dynamical Models of a Waste Incineration Plant from In-Furnace Images and Process Data
Takumi Kaneko, Yoshihisa Tsurumine, James Poon, Yukio Onuki, Yingda Dai, Kaoru Kawabata, Takamitsu Matsubara

A New Electrostatic Gripper for Flexible Handling of Fabrics in Automated Garment Manufacturing
Bin Sun, Xinyu Zhang

Hybrid evolutionary algorithm for integrated supply chain network design with assembly line balancing
Binqi Sun, Ling Wang

Scheduling and Routing of AGVs for Large-Scale Flexible Manufacturing Systems
Sarmad Riazi, Bengt Lennartson, Kristofer Bengtsson, Thomas Diding, Petter Falkman

Adaptive Real-Time Scheduling of Dynamic Multiple-Criticality Applications on Heterogeneous Distributed Computing Systems
Biao Hu, Zhengcai Cao, Lijie Zhou

QoS and Profit Aware Task Scheduling with Simulated-Annealing-Based Bi-Objective Differential Evolution in Green Clouds
Haitao Yuan, Jing Bi, MengChu Zhou

Task Assignment and Motion Planning for Bi-Manual Mobile Manipulation

On the optimization of cycle time in assembly lines with parallel workstations and tasks requiring multiple workers
Jinho Shin, Minho Lee, James Morrison

Exit Time Recursions, Reordering Principles, and Queue Equivalence in Generalized Regular Flow Lines
Sang-Yoon Bae, James Morrison
Monitoring of a Sampled Process Data under Run-To-Run Control: Application to a Semiconductor Process
Taki Eddine Korabi, Jacques Pinaton, Guillaume Graton, El Mostafa EL ADEL, Mustapha OULADSINE

Respect Your Emotion: Human-Multi-Robot Teaming Based on Regret Decision Model
Longsheng Jiang, Yue Wang

Cognitive Semantics for Dynamic Planning in Human-Robot Teams
Alexandre Angleraud, Quentin Houbre, Metodi Netzev, Roel S. Pieters

Dynamic Pricing for Autonomous Vehicle E-Hailing Services Reliability and Performance Improvement
Qixing Wang, Fei Miao, Jie Wu, Yuan Niu, Chengliang Wang, Nicholas Lownes

Reliable Cooperative Charging Protocol against Fault Data for Supercapacitors Charging Systems
Yang Miao, Jianping He, Shanying Zhu

A Distributed Control Approach Based on Game Theory for the Optimal Energy Scheduling of a Residential Microgrid with Shared Generation and Storage
Raffaele Carli, Mariagrazia Dotoli, Vittorio Palmisano

Robust Energy Scheduling of Interconnected Smart Homes with Shared Energy Storage under Quadratic Pricing
Seyed Mohsen Hosseini, Raffaele Carli, Mariagrazia Dotoli

A Time-Domain Decoupling Policy for Multi-Stage Robust Scheduling in a Corporate Energy System with V2G
Shihao Dai, Feng Gao, Kun Liu, Lei Yang

Simulation-Based Sensor Allocation for Dynamic Environment Estimation in Cyber-Physical Building System
Yaping Liu, Jiang Wu, Zhanbo Xu, Xiaohong Guan, Yuanjun Shen

A Simulation Platform for Sensing System Selection for Occupant Distribution Estimation in Smart Buildings
Jing-Xian Tang, Qing-Shan Jia

Falsification of Cyber-Physical Systems with Robustness Uncertainty Quantification through Stochastic Optimization with Adaptive Restart
Logan Mathesen, Shakiba Yaghoobi, Giulia Pedrielli, Georgios Fainekos

ROS-Based Robust and Recursive Optimal Control of Commercial Quadrotors
João Roberto Soares Benevides, Marlon Adriano Dal’Sochio Paiva, Roberto Inoue, Marco Henrique Terra

On the Use of Equivalence Classes for Optimal and Sub-Optimal Bin Covering
Sabino Francesco Roselli, Fredrik Hagebring, Sarmad Riazi, Martin Fabian, Knut Akesson

Automated in-house transportation of small load carriers with autonomous unmanned aerial vehicles
Markus Lieret, Vladyslav Kogan, Sebastian Döll, Jörg Franke
An Efficient Approach to Near-Optimal 3D Trajectory Design in Cluttered Environments for Multirotor UAVs
Daniele Sartori, Danping Zou, Wenxian Yu

Obstacle Persistent Adaptive Map Maintenance for Autonomous Mobile Robots Using Spatio-Temporal Reasoning
Meredith Pitsch, Mitchell Pryor

Vision-Only 3D Tracking for Self-Driving Cars
Carlos Diaz-Ruiz, Yan Wang, Wei-Lun Chao, Kilian Weinberger, Mark Campbell

Representation of Uncertain Occupancy Maps with High Level Feature Vectors
Janindu Arukgoda, Ravindra Ranasinghe, Gamini Dissanayake

A Hybrid Control Strategy for Autonomous Navigation While Avoiding Multiple Obstacles at Unknown Locations
Vijay Muthukumaran, Ricardo Sanfelice, Gabriel Hugh Elkaim

Electric Vehicle Fleet Relocation Management for Sharing Systems Based on Incentive Mechanism
Maria Pia Fanti, Agostino Marcello Mangini, Michele Roccotelli, Bartolomeo Silvestri, Salvatore Digiesi

Optimal Control of a Fleet of AGVs on a Rectangular Grid: A MILP-Based Approach
Jingjie Jiang, Dragan Obradovic

Video-Based Windshield Rain Detection and Wiper Control Using Holistic-View Deep Learning
Chi-Cheng Lai, Chih-Hung G. Li

Simultaneously Determining Target Object and Transport Velocity for Manipulator and Moving Vehicle in Piece-Picking Operation
Nobutaka Kimura, Ryo Sakai, Shinichi Katsumata, Nobuhiro Chihara

Vehicle Tire (tyre) Detection and Text Recognition Using Deep Learning
Wajahat Kazmi, Ian Nabney, George Vogiatzis, Peter Rose and Alexander Codd

Improved Dynamic Object Detection within Evidential Grids Framework
Abderraouf Hadj Henni, Angel Soriano, Rafael López Tarazón, Nacim Ramdani

Energy Autonomous Automation of Smart Home Applications Using the Example of a Wireless Indoor Smart Gardening System
Elke Mackensen, Julius Klose, Axel Rombach, Aaron Spitznagel

Thermal Modeling of Indoor Spaces Using Illumination Measurement As a Surrogate for Solar Heat Gain
M.H. Toufiq Imam, Sandipan Mishra

Derivation of a New Drive/coast Motor Driver Model for Real-Time Brushed DC Motor Control, and Validation on a MIP Robot
Eric Sihite, Daniel Yang, Thomas Bewley

Dynamics and Stability of Bat-Scale Flapping Wing Hovering Robot
Hamid Reza Vejdani
Robust Hazy QR Code Recognition Based on Dehazing and Improved Adaptive Thresholding Method
Zhengcai Cao, Junnian Li, Biao Hu

The Analysis of Haze Effect on Dense Semantic Mapping
Hongyu Xie, Qing Xiao, Dong Zhang, Zhengcai Cao

Efficient 3D Visual Perception for Robotic Rock Breaking
Longchuan Niu, Ke Chen, Kui Jia, Jouni Mattila

Dynamic Eye-in-hand Visual Servoing using Adaptive Backstepping with a Supervisory Feature Jacobian
Preston Roy, Chris Macnab, John Nielsen

Deep Workpiece Region Segmentation for Bin Picking
Muhammad Usman Khalid, Janik Hager, Werner Kraus, Marco F. Huber, Marc Toussaint

C-M2DP: A Fast Point Cloud Descriptor with Color Information to Perform Loop Closure Detection
Leonardo Perdomo, Diego Pittol, Mathias Fassini Mantelli, Renan Maffei, Mariana Kolberg, Edson Prestes

Concurrent Design of Tool-Paths and Impedance Controllers for Performing Area Coverage Operations in Manufacturing Applications under Uncertainty

Robotic Harvesting of a Moving Swarm Represented by a Markov Process
Shriya Bhatnagar, Steban Soto, Javier Garcia Gonzalez, Aaron Becker

Motion-Planning Using RRTs for a Swarm of Robots Controlled by Global Inputs
Parth Joshi, Julien Leclerc, Daniel Bao, Aaron Becker

Design and Characterization of a Novel, Continuum-Robot Surface for the Human Environment
Richa Sirohi, Yixiao Wang, Samantha Hollenberg, Isuru S. Godage, Ian Walker, Keith Evan Green

Computing Feedback Plans from Dynamical System Composition
Alfredo Bayuelo, Tauhidul Alam, Leonardo Bobadilla, Luis Fernando Niño, Ryan N. Smith

Design and Experimental Validation of Tube-Based MPC for Timed-constrained Robot Planning
Alexandros Nikou, Shahab Heshmati-alamndari, Dimos V. Dimarogonas

Mobile Robotic Radiation Surveying Using Recursive Bayesian Estimation
Robert Anderson, Mitchell Pryor, Sheldon Landsberger

Risk Aware Robots - Health Estimation and Capability Selection
Georg Heppner, Carsten Plasberg, Lennart Puck, Tristan Schnell, Timothee Buettner, Arne Roennau, Rüdiger Dillmann

Passive Tool Changer Development for an Elastic and Compliant Manipulator
Adam Pettinger, Conner Dimoush, Mitch Pryor
Towards Shared Autonomy Applications Using Whole-Body Control Formulations of Locomanipulation
Wolfgang Xaver Merkt, Vladimir Ivan, Yiming Yang, Sethu Vijayakumar

User-Guided Path Planning for Redundant Manipulators in Highly Constrained Work Environments
Pradeep Rajendran, Shantanu Thakar, Satyandra K. Gupta

Quantitative Variable Autonomy Levels for Traded Control in a Pick-And-Place Task
Christopher Robinson, Indika Wijayasinghe, Dan Popa

Multi-Robot Work Assignment Methods for Effectiveness Improvement of Deploying Service Robots
Jingze Dai, Hideya Yoshiuchi, Tomohiro Matsuda

A Time-of-Flight On-Robot Proximity Sensing System to Achieve Human Detection for Collaborative Robots
Odysseus Alexander Adamides, Anmol Saiprasad Modur, Shitij Kumar, Ferat Sahin

Day-Ahead Prediction of Building Occupancy Using WiFi Signals
Araz Ashouri, Guy R. Newsham, Zixiao Shi, H. Burak Gunay

Scenario-Based Model Predictive Control Approach for Heating Systems in an Office Building
Tomas Pippia, Jesus Lago, Roel De Coninck, Joris Sijs, Bart De Schutter

Experimental Validation of the Control-Oriented Model of Heat Pumps for MPC Applications
Soroush Rastegarpour, Lorenzo Caseri, Luca Ferrarini, Oliver Gehrke

Decentralized and Distributed Observer Design for Large-Scale Structures Using Dynamic Condensation
Alexander Warsewa, Michael Böhm, Philipp Rapp, Oliver Sawodny, Cristina Tarin

Homogenizability of Element Utilization in Adaptive Structures
Michael Böhm, Julia Laura Wagner, Simon Steffen, Werner Sobek, Oliver Sawodny

Modelling the Flow and Heat Transfer Characteristics of Perforated Foldcore Sandwich Composites for Application in Room Air Conditioning
Marius Oei, Yves Klett, Nadine Harder, Daniela Flemming, Oliver Sawodny

Robotic Learning for Increased Productivity: Autonomously Improving Speed of Robotic Visual Quality Inspection
Andrej Gams, Simon Reberšek, Bojan Nemec, Jure Škrabar, Rok Krhlík, Jure Skvarc, Ales Ude

Automatic Visual Leakage Inspection by Using Thermographic Video and Image Analysis
Mina Fahimipireghalin, Emanuel Trunzer, Matthias Odenweller, Birgit Vogel-Heuser

Automatic Damage Detection of Fasteners in Overhaul Processes
Sajjad Taheritajani, Ralf Schoenfeld, Bernd Bruegge

Embedded-Based Object Matching and Robot Arm Control
Minh-Tri Le, Chih-Hung G. Li, Shu-Mei Guo, Jenn-Jier James Lien
Optical In-Situ Verification of 3D-Printed Electronic Circuits
Florens Wasserfall, Norman Hendrich, Daniel Ahlers 1302

Using Spatial Constraints for Fast Set-Up of Precise Pose Estimation in an Industrial Setting
Frederik Hagel skjær, Thiusius Rajeeth Savarimuthu, Norbert Krüger, Anders Glent Buch 1308

Time-Optimal Playback Trajectory Generation for Hydraulic Material Handling Excavator
Hannes Wind, Anton Renner, Oliver Sawodny 1315

On-Demand Trajectory Planning with Load Sway Suppression and Obstacles Avoidance in Automated Overhead Traveling Crane System
Kanata Matsusawa, Yoshiyuki Noda, Akihiro Kaneshige 1321

Real-Time Path-Constrained Trajectory Tracking for Robot Manipulators with Energy Budget Optimization
Danilo Vannier, Cunha, Fernando Lizarralde 1327

Modeling Socially Normative Navigation Behaviors from Demonstrations with Inverse Reinforcement Learning
Xingyuan Gao, Xiaoguang Zhao, Min Tan 1333

Implementation of a Rapidly Executing Robot Controller
Daniel Gleeson, Christian Larsen, Johan Carlson, Bengt Lennartson 1341

Real-Time Object Coordinate Detection and Manipulator Control Using Rigidly Trained Convolutional Neural Networks
Yu-Ming Chang, Chih-Hung G. Li, Yi-Feng Hong 1347

Real-Time Visual-Based Localization for Mobile Robot Using Structured-View Deep Learning
Yi-Feng Hong, Yu-Ming Chang, Chih-Hung G. Li 1353

Hierarchical Task Planning from Object Goal State for Human-Assist Robot
Takayoshi Takayanagi, Yusuke Kurose, Tatsuya Harada 1359

Joint Torque Estimation Using Base Force-Torque Sensor to Facilitate Physical Human-Robot Interaction (pHRI)
Sumit Kumar Das, Mohammad Nasser Saadatzi, Shamsudeen Abubakar, Dan Popa 1367

Dex-Net MM: Deep Grasping for Surface Decluttering with a Low-Precision Mobile Manipulator
Benno Staub, Ajay Kumar Tanwani, Jeffrey Mahler, Michael Laskey, Yutaka Takaoka, Max Bajracharya, Ken Goldberg, Michel Breyer, Roland Siegwart 1373

Multi-Task Hierarchical Imitation Learning for Home Automation
Roy Fox, Ron Berenstein, Ion Stoica, Ken Goldberg 1380

Testing Safety PLCs Using QuickCheck
David Thönnessen, Nick Smallbone, Martin Fabian, Koen Claessen, Stefan Kowalewski 1388

A Unified Digital Twin Framework for Real-Time Monitoring and Evaluation of Smart Manufacturing Systems
Yassine Qamsane, Chien-Ying Chen, Efe Balta, Bin-Chou Kao, Sibin Mohan, James Moyne, Dawn Tilbury, Kira Barton 1394
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Dataspace: A Broker to Run Cyber-Physical-Social Production System in Level of Machining Workshops</td>
<td>1402</td>
</tr>
<tr>
<td>Pingyu Jiang, Chao Liu, Pulin Li, Haoliang Shi</td>
<td></td>
</tr>
<tr>
<td>Web Compliant Open Architecture for Teleoperation of Industrial Robots</td>
<td>1408</td>
</tr>
<tr>
<td>Juan Sebastian Toquica Arenas, Diego Armando Benavides Vidal, Jose Mauricio S. T. Motta</td>
<td></td>
</tr>
<tr>
<td>Visual-Guided Robot Arm Using Self-Supervised Deep Convolutional Neural Networks</td>
<td>1415</td>
</tr>
<tr>
<td>Van Thanh Nguyen, Chao Lin, Shu-Mei Guo, Chih-Hung G. Li, Jenn-Jier James Lien</td>
<td></td>
</tr>
<tr>
<td>Robust Toppling for Vacuum Suction Grasping</td>
<td>1421</td>
</tr>
<tr>
<td>Christopher Correa, Jeffrey Mahler, Michael Danieleczuk, Ken Goldberg</td>
<td></td>
</tr>
<tr>
<td>Automating Planar Object Singulation by Linear Pushing with Single-Point and Multi-Point Contacts</td>
<td>1429</td>
</tr>
<tr>
<td>Zisu Dong, Sanjay Krishnan, Sona Dolasia, Michael Danieleczuk, Ashwin Balakrishna, Ken Goldberg</td>
<td></td>
</tr>
<tr>
<td>Parameterized Model Predictive Control of a Nonholonomic Mobile Manipulator: A Terminal Constraint-Free Approach</td>
<td>1437</td>
</tr>
<tr>
<td>Raffaele Colombo, Francesco Gennari, Vivek Annem, Pradeep Rajendran, Shantanu Thakar, Luca Bascetta, Satyandra K. Gupta</td>
<td></td>
</tr>
<tr>
<td>On Sufficient Numbers of Fingers to Immobilize 3D Chains of Polyhedra</td>
<td>1443</td>
</tr>
<tr>
<td>A.Frank van der Stappen, Mansoor Davoodi</td>
<td></td>
</tr>
<tr>
<td>Full 6-DOF Admittance Control for the Industrial Robot Stäubli TX60</td>
<td>1450</td>
</tr>
<tr>
<td>Sven Tittel, Milad S. Malekzadeh, Jochen J. Steil</td>
<td></td>
</tr>
<tr>
<td>Comparing the Performance of Explicit and Implicit Communication in Simple Object Manipulation Tasks</td>
<td>1456</td>
</tr>
<tr>
<td>Naomi Gildert, Jon Timmis, Andrew Pomfret</td>
<td></td>
</tr>
<tr>
<td>Collaborative Object Manipulation through Indirect Control of Deformable Sheet by a Mobile Robotic Team</td>
<td>1463</td>
</tr>
<tr>
<td>Kyle Hunte, Jingang Yi</td>
<td></td>
</tr>
<tr>
<td>Motion Planning for Multi-Mobile-Manipulator Payload Transport Systems</td>
<td>1469</td>
</tr>
<tr>
<td>Rahul Tallamraju, Durgesh Salunkhe, Sujit Rajappa, Aamir Ahmad, Kamalakar Karlapalem, Suril Vijaykumar Shah</td>
<td></td>
</tr>
<tr>
<td>Generation of High-Density Hyperspectral Point Clouds of Crops with Robotic Multi-Camera Planning</td>
<td>1475</td>
</tr>
<tr>
<td>Merrill Edmonds, Jingang Yi, Naveen Kumar Singa, Lingyun Wang</td>
<td></td>
</tr>
<tr>
<td>Bi-Objective Routing for Robotic Irrigation and Sampling in Vineyards</td>
<td>1481</td>
</tr>
<tr>
<td>Thomas C. Thayer, Stavros Vougioukas, Ken Goldberg, Stefano Carpin</td>
<td></td>
</tr>
<tr>
<td>RAPID-MOLT: A Meso-Scale, Open-Source, Low-Cost, Testbed for Robot Assisted Precision Irrigation and Delivery</td>
<td>1489</td>
</tr>
<tr>
<td>Marius Wiggert, Leela Amladi, Ron Berenstein, Stefano Carpin, Joshua Viers, Stavros Vougioukas, Ken Goldberg</td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Comparing Alternate Modes of Teleoperation for Constrained Tasks</td>
<td>1497</td>
</tr>
<tr>
<td>Christopher Edwin Mower, Wolfgang Xaver Merkt, Aled Davies, Sethu</td>
<td></td>
</tr>
<tr>
<td>Vijayakumar</td>
<td></td>
</tr>
<tr>
<td>Blue Gripper: A Robust, Low-Cost, and Force-Controlled Robot Hand</td>
<td>1505</td>
</tr>
<tr>
<td>Menglong Guo, Philipp Wu, Brent Yi, David V. Gealy, Stephen McKinley,</td>
<td></td>
</tr>
<tr>
<td>Pieter Abbeel</td>
<td></td>
</tr>
<tr>
<td>Design and Gait Control of a Quadruped Robot with Low-Inertia Legs</td>
<td>1511</td>
</tr>
<tr>
<td>Linlin Shang, Wei Wang, Jianqiang Yi</td>
<td></td>
</tr>
<tr>
<td>An Adaptive Chain-Type Treadmill-Based Traction Testbed for the</td>
<td>1517</td>
</tr>
<tr>
<td>Wheeled Planetary Exploration Rover: Design, Modeling and Experimental</td>
<td></td>
</tr>
<tr>
<td>Validation</td>
<td></td>
</tr>
<tr>
<td>Haitao Yu, Cao Li, Limeng Tan, Shengjun Wang, Haibo Gao</td>
<td></td>
</tr>
<tr>
<td>Computation of Unique Kinematic Solutions of a Spherical Parallel</td>
<td>1524</td>
</tr>
<tr>
<td>Manipulator with Coaxial Input Shafts</td>
<td></td>
</tr>
<tr>
<td>Iliyas Tursynbek, Atibek Niyetkaliyev, Almas Shintemirov</td>
<td></td>
</tr>
<tr>
<td>A Joint-Selective Robotic Gripper with Actuation Mode Switching</td>
<td>1532</td>
</tr>
<tr>
<td>Katharina Hermann, Rafael Hostettler, Markus Zimmermann, Anand</td>
<td></td>
</tr>
<tr>
<td>Vazhapilli Sureshbabu</td>
<td></td>
</tr>
<tr>
<td>Bin-Picking Robot Using a Multi-Gripper Switching Strategy Based on</td>
<td>1540</td>
</tr>
<tr>
<td>Object Sparseness</td>
<td></td>
</tr>
<tr>
<td>Masahiro Fujita, Yukiyasu Domae, Ryosuke Kawanishi, Kenta Kato,</td>
<td></td>
</tr>
<tr>
<td>Koji Shiratsuchi, Rintaro Haraguchi, Ryosuke Araki, Hironobu Fujiyoshi</td>
<td></td>
</tr>
<tr>
<td>Shuichi Akizuki, Manabu Hashimoto, Gustavo Alfonso Garcia Ricardela,</td>
<td></td>
</tr>
<tr>
<td>Albert Causo, Haruhisa Okuda, Akio Noda, Tsukasa Ogasawara</td>
<td></td>
</tr>
<tr>
<td>Modeling Bimorph Piezoelectric Actuator Exhibiting Frequency-Dependent</td>
<td>1548</td>
</tr>
<tr>
<td>Interleaved Hysteresis with Occasional Odd Harmonic Oscillation</td>
<td></td>
</tr>
<tr>
<td>Kohei Morita, Fumitake Fujii</td>
<td></td>
</tr>
<tr>
<td>Multiphysics Dynamic Model Validation Methodology for Laser-Driven</td>
<td>1555</td>
</tr>
<tr>
<td>Microrobots</td>
<td></td>
</tr>
<tr>
<td>Zhong Yang, Mohammad Nasser Saadatzi, Ruoshi Zhang, Andriy Sherehiy,</td>
<td></td>
</tr>
<tr>
<td>Danming Wei, Cindy Harnett, Dan O.Papa</td>
<td></td>
</tr>
<tr>
<td>Flatness-Based Powertrain Control for Engine Start Applications in</td>
<td>1562</td>
</tr>
<tr>
<td>Hybrid Dual-Clutch Transmissions</td>
<td></td>
</tr>
<tr>
<td>Michael A. Mrochen, Oliver Sawodny</td>
<td></td>
</tr>
<tr>
<td>An Enhanced POE-Based Method with Identified Transmission Errors for</td>
<td>1568</td>
</tr>
<tr>
<td>Serial Robotic Kinematic Calibration</td>
<td></td>
</tr>
<tr>
<td>Chentao Mao, Zhangwei Chen, Hongfei Zu, Xiang Zhang</td>
<td></td>
</tr>
<tr>
<td>Weld Defect Detection Based on Deep Learning Method</td>
<td>1574</td>
</tr>
<tr>
<td>Haodong Zhang, Zuzhi Chen, Chaouqun Zhang, Jun tong Xi, Xinyi Le</td>
<td></td>
</tr>
<tr>
<td>A Heuristic Pathfinding Algorithm for Dynamic Fault Tolerance in</td>
<td>1580</td>
</tr>
<tr>
<td>Manufacturing Networks</td>
<td></td>
</tr>
<tr>
<td>Yinan Wu, Gongzhuang Peng, Heming Zhang</td>
<td></td>
</tr>
<tr>
<td>Hidden Markov Model Combined with Kernel Principal Component Analysis</td>
<td>1586</td>
</tr>
<tr>
<td>for Nonlinear Multimode Process Fault Detection</td>
<td></td>
</tr>
<tr>
<td>Peng Peng, Jiaxin Zhao, Yi Zhang, Heming Zhang</td>
<td></td>
</tr>
<tr>
<td>Surface Defect Detection using Hierarchical Features</td>
<td>1592</td>
</tr>
<tr>
<td>Ling Xiao, Tao Huang, Bo Wu, Youmin Hu, Jiehan Zhou</td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Multi-camera coverage of deformable contour shapes</td>
<td>1597</td>
</tr>
<tr>
<td>Rafael Herguedas, Gonzalo Lopez-Nicolas, Carlos Sagues</td>
<td></td>
</tr>
<tr>
<td>Robust 2D Assembly Sequencing via Geometric Planning with Learned Scores</td>
<td>1603</td>
</tr>
<tr>
<td>Tzvika Geft, Aviv Tamar, Ken Goldberg, Dan Halperin</td>
<td></td>
</tr>
<tr>
<td>Jerk Limited Planner for Real-Time Applications Requiring Variable Velocity Bounds</td>
<td>1611</td>
</tr>
<tr>
<td>Marina Raineri, Corrado Guarino Lo Bianco</td>
<td></td>
</tr>
<tr>
<td>Bin-Picking Using Model-Free Visual Heuristics and Grasp-Constrained Imaging</td>
<td>1618</td>
</tr>
<tr>
<td>Christopher Robinson, Mohammad Nasser Saadatzi, Dan O.Popa</td>
<td></td>
</tr>
<tr>
<td>Type-2 Fuzzy Neural Network Synchronization of Teleoperation Systems with Delay and Uncertainties</td>
<td>1625</td>
</tr>
<tr>
<td>Parham Mohsenzadeh Keбрия, Abbas Khosravi, Seyed Mohammad Jafar Jalali, Saeid Nahavandi</td>
<td></td>
</tr>
<tr>
<td>Adaptive Type-2 Fuzzy Control Scheme for Robust Teleoperation under Time-Varying Delay and Uncertainties</td>
<td>1631</td>
</tr>
<tr>
<td>Parham Mohsenzadeh Keбрия, Abbas Khosravi, Seyed Mohammad Jafar Jalali, Saeid Nahavandi</td>
<td></td>
</tr>
<tr>
<td>Average Consensus in Matrix-Weight-Balanced Digraphs</td>
<td>1637</td>
</tr>
<tr>
<td>Yogesh Chinnappa, Daniela Constantinescu</td>
<td></td>
</tr>
<tr>
<td>Passive Device Synchronization for the External Control of Robotic Applications in Ethernet Networks Based on a Phase-Locked Loop</td>
<td>1643</td>
</tr>
<tr>
<td>Marc Priggemeyer, Katrin Gartenmeister, Juergen Roßmann</td>
<td></td>
</tr>
<tr>
<td>Deep Reinforcement Learning of Robotic Precision Insertion Skill Accelerated by Demonstrations</td>
<td>1651</td>
</tr>
<tr>
<td>Xiapeng Wu, Dapeng Zhang, Fangbo Qin, De Xu</td>
<td></td>
</tr>
<tr>
<td>Vision-Less Bin-Picking for Small Parts Feeding</td>
<td>1657</td>
</tr>
<tr>
<td>Simon Mathiesen, Iñigo Iturrate, Aljaz Kramberger</td>
<td></td>
</tr>
<tr>
<td>Automatic Fingertip Exchange System for Robotic Grasping in Flexible Production Processes</td>
<td>1664</td>
</tr>
<tr>
<td>Aljaz Kramberger, Adam Wolniakowski, Mads Hoi Rasmussen, Marko Munih, Ales Ude, Christian Schlette</td>
<td></td>
</tr>
<tr>
<td>Reconfigurable Multi-UAV Formation Using Angle-Encoded PSO</td>
<td>1670</td>
</tr>
<tr>
<td>Van Truong Hoang, Manh Duong Phung, Tran Hiep Dinh, Qiuchen Zhu, Q P Ha</td>
<td></td>
</tr>
<tr>
<td>On the Trustability of the Safety Measures of Collaborative Robots: 2D Collision-Force-Map of a Sensitive Manipulator for Safe HRC</td>
<td>1676</td>
</tr>
<tr>
<td>Andreas Schlotzhauer, Lukas Kaiser, Jasmin Wachter, Mathias Brandstötter, Michael Hofbaur</td>
<td></td>
</tr>
<tr>
<td>Speed and Separation Monitoring using On-Robot Time-of-Flight Laser-ranging Sensor Arrays</td>
<td>1684</td>
</tr>
<tr>
<td>Shitij Kumar, Sarthak Arora, Ferat Sahin</td>
<td></td>
</tr>
<tr>
<td>Determining Object Properties from Tactile Events During Grasp Failure</td>
<td>1692</td>
</tr>
<tr>
<td>Jennifer Kwiatkowski, Jean-Simon Lavertu, Chloé Gourrat, Vincent Duchaine</td>
<td></td>
</tr>
<tr>
<td>Handling Unforeseen Failures Using Argumentation-Based Learning</td>
<td>1699</td>
</tr>
<tr>
<td>Hamed Ayoobi, Ming Cao, Bart Verheij, Rineke Verbrugge</td>
<td></td>
</tr>
</tbody>
</table>
Data-Efficient Process Monitoring and Failure Detection for Robust Robotic Screwdriving
Xianyi Cheng, Zhenzhong Jia, Matthew T. Mason

Detecting Intermittent Faults with Moving Average Techniques
Yinghong Zhao, Xiao He, Donghua Zhou

Investigating the Survivability of Drone Swarms with Flocking and Swarming Flight Patterns Using Virtual Reality
Daniel Biediger, Arun Mahadev, Aaron T. Becker

InSPeCT: Iterated Local Search for Solving Path Conditions
Fuxiang Chen, Aldy Gunawan, David Lo, Sunghun Kim

Model-Driven Mechatronic System Development
Martin Paczona, Heinrich C. Mayr

3D Printing of Nonplanar Layers for Smooth Surface Generation
Daniel Ahlers, Florens Wasserfall, Norman Hendrich, Jianwei Zhang

Monitoring and Control of the Heat Input in MAG-Laser-Hybrid Welding of High Strength Steel in Telescopic Crane Booms
Sven-Frithjof Goecke, Thomas Seefeld, Dieter Tyralla, Andreas Krug

Robotic additive manufacturing system featuring wire deposition by electric arc for high-value manufacturing
Richard Stephen French, Hector Marin-Reyes, Gabriel Kapellmann-Zafra, Samantha Abrego-Hernandez

Welding Process Monitoring Applications and Industry 4.0
Michalis Benakis, Chunling Du, Alin Patran, Richard Stephen French

U-Net with Optimal Thresholding for Small Blob Detection in Medical Images
Yanzhe Xu, Fei Gao, Teresa Wu, Kevin Bennett, Jennifer Charlton, Suryadipto Sarkar

Control of a Mechatronics-Assisted System for Surgeries Using Flexible Tools
Lingbo Cheng, Mahdi Tavakoli

Semi-Autonomous Surgical Robot Control for Beating-Heart Surgery
Lingbo Cheng, Jason Fong, Mahdi Tavakoli

An MPC Scheme for Traffic Coordination in Open and Irreversible, Zone-Controlled, Guidepath-Based Transport Systems
Spiridon Reveliotis

Automated Data Retrieval from Large-Scale Distributed Satellite Systems
Dominik Michael Krupke, Volker Schaus, Andreas Haas, Michael Perk, Jonas Dippel, Benjamin Grzesik, Mohamed Khalil Ben Larbi, Enrico Stoll, Tom Haylock, Harald Konstanski, Kattia Flores Pozo, Mirue Choi, Christian Schurig, Sándor Fekete
What Are the Most Informative Data for Virtual Metrology? a Use Case on Multi-Stage Processes Fault Prediction
Marco Maggipinto, Gian Antonio Susto, Federico Zocco, Sean McLoone

Automating Visual Inspection of Lyophilized Drug Products with Multi-Input Deep Neural Networks
Calvin Tsay, Zheng Li

Active Contact Enhancements with Stretchable Soft Layers and Piezoresistive Tactile Array for Robotic Grippers
Godwin Ponraj Joseph Vedhagiri, Prituja A.V., Changsheng Li, Abhishek Bamotra, Guoniu Zhu, Kirthika Senthil Kumar, Nitish Thakor, Alcimar B Soares, Hongliang Ren

A Robust Polyurethane Depositing System for Overcoming Obstacles in Disaster Scenario Robotics
Alec John Burns, Sebastiano Fichera, Paolo Paoletti

Singularity-Robust Inverse Kinematics Solver for Telemanipulation
Valerio Ortenzi, Naresh Marturi, Vijaykumar Rajasekaran, Komlan Jean Maxime Adjigble, Rustam Stolkin

Creating an Obstacle Memory through Event-Based Stereo Vision and Robotic Proprioception
Lea Steffen, Benedict Hauck, Jacques Kaiser, Jakob Weinland, Stefan Ulbrich, Daniel Reichard, Arne Roennau, Rüdiger Dillmann

WinBot: A Disc Cutter Wear Inspection Robot for a Tunnel Boring Machine
Yudai Yamada, Rui Fukui, Shin’ichi Warisawa, Eiichi Morioka, Masaaki Uetake, Shin’ichi Terada