

2nd International Manufacturing Engineering Conference and 3rd Asia-Pacific Conference on Manufacturing Systems (iMEC-APCOMS 2015)

IOP Conference Series: Materials Science
and Engineering Volume 114

Kuala Lumpur, Malaysia
12 – 14 November 2015

Part 1 of 2

Editor:

Zamzuri Hamedon

ISBN: 978-1-5108-2230-6
ISSN: 1757-8981

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2015) by the Institute of Physics
All rights reserved. The material featured in this book is subject to
IOP copyright protection, unless otherwise indicated.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.org

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
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

PART 1

PROCESS

| | |
|---|------------|
| IMPROVEMENT OF FORMABILITY OF HIGH STRENGTH STEEL SHEETS IN SHRINK FLANGING..... | 1 |
| <i>Z Hamedon, Y Abe, K Mori</i> | |
| A REVIEW ON THE APPLICATION OF PEENING PROCESSES FOR SURFACE TREATMENT..... | 8 |
| <i>A Azhari, S Sulaiman, A K Prasada Rao</i> | |
| ESTIMATION OF THERMAL CONTACT CONDUCTANCE BETWEEN BLANK AND TOOL SURFACE IN HOT STAMPING PROCESS..... | 17 |
| <i>Zahari Taha, M A Hanafiah Shahrudin</i> | |
| SIMULATION ON THE EFFECT OF BOTTLE WALL THICKNESS DISTRIBUTION USING BLOW MOULDING TECHNIQUE..... | 26 |
| <i>S Suraya, M D Azman, N Fatchurrohman, A A Jaafar, A R Yusoff</i> | |
| FINITE ELEMENT STUDY OF THE EFFECT OF SUBSTRATE PROPERTIES IN MICRO-CUTTING THIN WORKPIECE MATERIALS | 32 |
| <i>K Saptaji, S Subbiah</i> | |
| EFFECT OF HIGH-SPEED MILLING TOOL PATH STRATEGIES ON THE SURFACE ROUGHNESS OF STAVAX ESR MOLD INSERT MACHINING | 43 |
| <i>A. Mebrahitom, D. Rizuan, M. Azmir, M Nassif</i> | |
| FINITE ELEMENT ANALYSIS OF ECAP, TCAP, RUE AND CGP PROCESSES | 49 |
| <i>Deepak C Patil, Vinayak Kallannavar, Prabhakar M. Bhovi, S A Kori, K Venkateswarlu</i> | |
| CONTACT PRESSURE DISTRIBUTION DURING THE POLISHING PROCESS OF CERAMIC TILES: A LABORATORY INVESTIGATION..... | 67 |
| <i>A S A Sani, F J P Sousa, Z Hamedon, A Azhari</i> | |
| STUDY THE EFFECT OF ELEVATED DIES TEMPERATURE ON ALUMINIUM AND STEEL ROUND DEEP DRAWING..... | 86 |
| <i>Yeong Wei Lean, M. Azuddin</i> | |
| INVESTIGATION OF SURFACE ROUGHNESS AND TOOL WEAR LENGTH WITH VARYING COMBINATION OF DEPTH OF CUT AND FEED RATE OF ALUMINIUM ALLOY AND P20 STEEL MACHINING..... | 100 |
| <i>Madan Varmma A/l Suparmaniam, Ahmad Razlan Yusoff</i> | |
| TEMPERATURE ASSESSMENT OF HEATING STAGE FOR A THERMOFORMING EQUIPMENT | 109 |
| <i>F. A. Mohd Ghazali, M. N. Ahmad, M. F. Ab Rahim, A. A. Jaafar</i> | |
| CAE APPLICATIONS IN A THERMOFORMING MOULD DESIGN..... | 116 |
| <i>Ar Marjuki, Fa Mohd Ghazali, N M Ismail, S Sulaiman, I Mohd Khairuddin, Anwar P P A Majeed, Aa Jaafar, F Mustapha, S Basri</i> | |
| CUTTING ORIENTATIONS FOR NON-COMPLEX PARTS IN 4TH AXIS MACHINING | 125 |
| <i>M N Osman Zahid, K Case, D M Watts</i> | |
| ANALYSIS OF PARAMETERS ASSESSMENT ON LAMINATED RUBBER-METAL SPRING FOR STRUCTURAL VIBRATION..... | 132 |
| <i>M. A. Salim, A. Putra, M. R. Mansor, M. T. Musthafah, M. Z. Akop, M. A. Abdullah</i> | |
| RESPONSE SURFACE METHODOLOGY APPROACH ON EFFECT OF CUTTING PARAMETER ON TOOL WEAR DURING END MILLING OF HIGH THERMAL CONDUCTIVITY STEEL -150 (HTCS-150)..... | 144 |
| <i>A B Mohd Hadzley, W M Y Wan Mohd Azahar, R Izamshah, K Mohd Shahir, A Mohd Amran, A Anis Afuza</i> | |
| CFD BASED EROSION MODELLING OF ABRASIVE WATERJET NOZZLE USING DISCRETE PHASE METHOD..... | 151 |
| <i>Naqib Hakim Kamarudin, A K Prasada Rao, Azmir Azhari</i> | |
| EVALUATION OF SURFACE ROUGHNESS AND POWER CONSUMPTION IN MACHINING FCD 450 CAST IRON USING COATED AND UNCOATED IRREGULAR MILLING TOOLS..... | 159 |
| <i>Ahmad Razlan Yusoff, Fitriyanti Arsyad</i> | |
| DRY MACHINING PROCESS OF MILLING MACHINE USING AXIOMATIC GREEN METHODOLOGY | 167 |
| <i>Gita Puspita Andriani, Muhammad Akbar, Dradjad Irianto</i> | |

| | |
|--|------------|
| PREPARATION OF POLYPROPYLENE THERMOPLASTIC CONTAINER VIA THERMOFORMING PROCESS | 176 |
| <i>Nik Ruqiyah Nik Hassan, Farah Amira Mohd Ghazali, Abdul Aziz Jaafar, Noor Mazni Ismail</i> | |
| A REVIEW ON NOZZLE WEAR IN ABRASIVE WATER JET MACHINING APPLICATION | 186 |
| <i>H. Syazwani, G. Mebrahitom, A. Azmir</i> | |
| SUSTAINABLE COOLING METHOD FOR MACHINING TITANIUM ALLOY..... | 194 |
| <i>B Boswell, M N Islam</i> | |
| EFFECT OF COOLING METHODS ON HOLE QUALITY IN DRILLING OF ALUMINIUM 6061-6T | 206 |
| <i>M N Islam, B Boswell</i> | |
| GREY RELATIONAL ANALYSES FOR MULTI-OBJECTIVE OPTIMIZATION OF TURNING S45C CARBON STEEL | 223 |
| <i>A. H. A. Shah, A. I. Azmi, A. N. M. Khalil</i> | |
| STUDY ON OPTIMAL SURFACE PROPERTY OF WC-CO CUTTING TOOL FOR ALUMINIUM ALLOY CUTTING | 234 |
| <i>Mohd Nizar, Naoya Arimatsu, Hiroshi Kawamitsu, Kazuteru Takai, Masahiro Fukumoto</i> | |
| SPRING-BACK SIMULATION OF UNIDIRECTIONAL CARBON/EPOXY L- SHAPED LAMINATE COMPOSITES MANUFACTURED THROUGH AUTOCLAVE PROCESSING | 244 |
| <i>M N M Nasir, L Mezeix, Y Aminanda, M A Seman, A Rivai, K M Ali</i> | |
| THE FABRICATION OF PDMS MOULD FOR MICROELECTRODE ARRAY BIOCHIP USING NIL | 255 |
| <i>Khi Khim Beh, Fahmi Samsuri, Tze Pin Lee, Khairudin Mohamed</i> | |
| MODELS FOR SELECTING GMA WELDING PARAMETERS FOR IMPROVING MECHANICAL PROPERTIES OF WELD JOINTS | 266 |
| <i>P Srinivasa Rao, Pragash Ramachandran, S Jebaraj</i> | |
| MEASUREMENT OF INTERFACIAL PROFILES OF WAVY FILM FLOW ON INCLINED WALL | 271 |
| <i>N Rosli, K Amagai</i> | |
| INVESTIGATION OF THIN FILM DEPOSITION ON STAINLESS STEEL 304 SUBSTRATES UNDER DIFFERENT OPERATING CONDITIONS..... | 281 |
| <i>M A Chowdhury, D M Nuruzzaman</i> | |
| DEPOSITION OF HARD CHROME COATING ONTO HEAT SUSCEPTIBLE SUBSTRATES BY LOW POWER MICROWAVE PLASMA SPRAY | 289 |
| <i>Ahmad Redza, Toshiaki Yasui, Masahiro Fukumoto</i> | |
| HIGH ANATASE RATE TITANIUM DIOXIDE COATING DEPOSITION BY LOW POWER MICROWAVE PLASMA SPRAY..... | 298 |
| <i>Ahmad Redza, Toshiki Kondo, Toshiaki Yasui, Masahiro Fukumoto</i> | |
| 3D MICROFABRICATION USING EMULSION MASK GRAYSCALE PHOTOLITHOGRAPHY TECHNIQUE..... | 308 |
| <i>Tze Pin Lee, Khairudin Mohamed</i> | |
| EXPERIMENTAL VALIDATION FOR HOT STAMPING PROCESS BY USING TAGUCHI METHOD..... | 316 |
| <i>Mohd Fawzi Zamri, Syh Kai Lim, Ahmad Razlan Yusoff</i> | |
| DETERMINATION OF HEAT TRANSFER COEFFICIENT FOR AN INTERACTION OF SUB-COOLED GAS AND METAL..... | 324 |
| <i>Mohd Zaidi Sidek, Muhammad Syahidan Kamarudin</i> | |
| EXPERIMENTAL INVESTIGATIONS DURING DRY EDM OF INCONEL - 718 | 332 |
| <i>A S Bhandare, U A Dabade</i> | |
| RECENT DEVELOPMENTS IN MICRO FRICTION STIR WELDING: A REVIEW | 340 |
| <i>Keydon Sithole, Veeredhi Vasudeva Rao</i> | |
| DEVELOPMENT OF KEROPOK KEPING DRYING MACHINE FOR SMALL & MEDIUM ENTERPRISES (SMES) | 351 |
| <i>S. Mohamaddan, A. M. A. A. Mohd Mohtar, N. Junaidi, N. A. A. Mohtadzar, M. S. Z. Mohamad Suffian</i> | |
| POSE ESTIMATION USING 1D FOURIER TRANSFORM AND EUCLIDEAN DISTANCE MATCHING OF CAD MODEL AND INSPECTED MODEL PART | 357 |
| <i>Zuliani Zulkoffli, Elmi Abu Bakar</i> | |
| EVALUATION OF MOLTEN AREA IN MICRO-WELDING OF MONOCRYSTALLINE SILICON AND GLASS | 369 |
| <i>I H W Nordin, Y Okamoto, I Miyamoto, A Okada</i> | |
| FINITE-ELEMENT ANALYSIS OF NITI WIRE DEFLECTION DURING ORTHODONTIC LEVELLING TREATMENT..... | 375 |
| <i>M F Razali, A S Mahmud, N Mokhtar, J Abdullah</i> | |

| | |
|---|-----|
| INFLUENCE OF PARTICLE SIZE ON CUTTING FORCES AND SURFACE ROUGHNESS IN MACHINING OF B₄C_p - 6061 ALUMINIUM MATRIX COMPOSITES | 382 |
| <i>Vijaykumar Hiremath, Pradeep Badiger, V Auradi, S T Dundur, S A Kori</i> | |
| DEVELOPMENT OF AXIAL CONTINUOUS METAL EXPELLER FOR MELT CONDITIONING OF ALLOYS | 391 |
| <i>Z. Cassinath, A. K. Prasada Rao</i> | |
| MODELING AND FLOW ANALYSIS OF PURE NYLON POLYMER FOR INJECTION MOLDING PROCESS | 397 |
| <i>D M Nuruzzaman, N Kusaseh, S Basri, A N Oumer, Z Hamedon</i> | |
| THE DEVELOPMENT OF MINI PORTABLE DIGESTER DESIGNS FOR DOMESTIC AND RESTAURANT SOLID WASTE PROCESSING TO BE CLEAN BIOGAS AS ENERGY'S ALTERNATIVE TO REPLACE LPG | 404 |
| <i>A Mansur, D Janari Dan, N Setiawan</i> | |
| IMPROVING EFFICIENCY OF ALUMINIUM SACRIFICIAL ANODE USING COLD WORK PROCESS | 411 |
| <i>Y. P. Asmara, J. P. Siregar, C. Tezara, Chang Tai Ann</i> | |
| FABRICATION OF HIGH ASPECT RATIO MICRO ELECTRODE BY USING EDM | 417 |
| <i>Nagwa Mejid Elsiiti, M. Y. Noordin, Adam Umar Alkali</i> | |

SYSTEM

| | |
|---|-----|
| PROPOSAL FOR A CONCEPTUAL MODEL FOR EVALUATING LEAN PRODUCT DEVELOPMENT PERFORMANCE: A STUDY OF LPD ENABLERS IN MANUFACTURING COMPANIES | 422 |
| <i>Daniel Osezua Aikhuele, Faiz Mohd Turan</i> | |
| A HYBRID FUZZY MODEL FOR LEAN PRODUCT DEVELOPMENT PERFORMANCE MEASUREMENT | 427 |
| <i>Daniel Osezua Aikhuele, Faiz Mohd Turan</i> | |
| SIMULATION OF ASSEMBLY LINE BALANCING IN AUTOMOTIVE COMPONENT MANUFACTURING | 432 |
| <i>Muthanna Jamil, Noraini Mohd Razali</i> | |
| COLLABORATIVE MANUFACTURING FOR SMALL-MEDIUM ENTERPRISES | 440 |
| <i>D Irianto</i> | |
| REDUCING BITS IN ELECTRODEPOSITION PROCESS OF COMMERCIAL VEHICLE - A CASE STUDY | 446 |
| <i>Nabiilah Ab Rahim, Zamzuri Hamedon, Faiz Mohd Turan, Ismed Iskandar</i> | |
| AN FMS DYNAMIC PRODUCTION SCHEDULING ALGORITHM CONSIDERING CUTTING TOOL FAILURE AND CUTTING TOOL LIFE | 454 |
| <i>A Setiawan, R Wangsaputra, Y Y Martawirya, A H Halim</i> | |
| METHODOLOGY ON INVESTIGATING THE INFLUENCES OF AUTOMATED MATERIAL HANDLING SYSTEM IN AUTOMOTIVE ASSEMBLY PROCESS | 464 |
| <i>Seha Saffar, Fairul Azni Jafar, Zamberi Jamaludin</i> | |
| IMPROVING QUALITY OF SEAL LEAK TEST PRODUCT USING SIX SIGMA | 474 |
| <i>Abdullah Luthfi Malik, Muhammad Akbar, Dradjad Irianto</i> | |
| PERFORMANCE EVALUATION OF DIFFERENT TYPES OF PARTICLE REPRESENTATION PROCEDURES OF PARTICLE SWARM OPTIMIZATION IN JOB-SHOP SCHEDULING PROBLEMS | 479 |
| <i>Nurul Izah Anuar, Adi Saptari</i> | |
| COMPARISON OF QUALITY ENGINEERING PRACTICES IN MALAYSIAN AND INDONESIAN AUTOMOTIVE RELATED COMPANIES | 484 |
| <i>Nilda Tri Putri, Yusof Sha'Ri Mohd, Dradjad Irianto</i> | |
| META-HEURISTIC ALGORITHM TO SOLVE TWO-SIDED ASSEMBLY LINE BALANCING PROBLEMS | 497 |
| <i>A D Wirawan, A Maruf</i> | |
| DESIGN AND ANALYSIS OF TOOTH IMPACT TEST RIG FOR SPUR GEAR | 508 |
| <i>Wafiuddin Bin Md Ghazali, Ismail Ali Bin Abdul Aziz, Daing Mohamad Nafiz Bin Daing Idris, Nurazima Binti Ismail, Azizul Helmi Bin Sofian</i> | |
| QUALITY TOOLS AND TRIZ BASED QUALITY IMPROVEMENT CASE STUDY AT PT 'X' A PLASTIC MOULDING MANUFACTURING INDUSTRY | 520 |
| <i>Christina Wirawan, Fory Chandra</i> | |

| | |
|--|-----|
| FLEXIBLE JOB-SHOP SCHEDULING WITH DUAL-RESOURCE CONSTRAINTS TO MINIMIZE TARDINESS USING GENETIC ALGORITHM | 529 |
| <i>A B N Paksi, A Ma'Ruf</i> | |
| SCHEDULING METHOD FOR MTS/MTO PRODUCTION SYSTEM | 538 |
| <i>Tadeuz, A Maruf</i> | |
| JOB SHOP SCHEDULING MODEL FOR NON-IDENTIC MACHINE WITH FIXED DELIVERY TIME TO MINIMIZE TARDINESS | 548 |
| <i>K K Kusuma, A Maruf</i> | |
| ANALYSIS OF MAINTENANCE SERVICE CONTRACTS FOR DUMP TRUCKS USED IN MINING INDUSTRY WITH SIMULATION APPROACH | 555 |
| <i>A Dymasius, R Wangsaputra, B P Iskandar</i> | |
| COMPETING RISK MODELS IN RELIABILITY SYSTEMS, A WEIBULL DISTRIBUTION MODEL WITH BAYESIAN ANALYSIS APPROACH | 565 |
| <i>Ismed Iskandar, Yudi Satria Gondokaryono</i> | |
| CONTRIBUTION TO THE MODELLING AND ANALYSIS OF LOGISTICS SYSTEM PERFORMANCE BY PETRI NETS AND SIMULATION MODELS: APPLICATION IN A SUPPLY CHAIN | 573 |
| <i>Yassine Azougagh, Khalid Benhida, Said Elfezazi</i> | |
| MODELLING A FLOWS IN SUPPLY CHAIN WITH ANALYTICAL MODELS: CASE OF A CHEMICAL INDUSTRY | 583 |
| <i>Khalid Benhida, Yassine Azougagh, Said Elfezazi</i> | |
| GENERATION OF LOOK-UP TABLES FOR DYNAMIC JOB SHOP SCHEDULING DECISION SUPPORT TOOL | 591 |
| <i>Muchamad Oktaviandri, Adnan Hassan, Awaluddin Mohd Shaharoun</i> | |
| IMPLEMENTATION LEARNING AND FORGETTING CURVE TO SCHEDULING IN GARMENT INDUSTRY | 600 |
| <i>Huda Muhamad Badri, Baba Md Deros, M Syahri, Chairul Saleh, Aninda Fitria</i> | |
| LEAN PRODUCTION IN IMPROVING SUPPLY CHAIN PERFORMANCE THROUGH HYBRID MODEL SCOR 11.0 - SYSTEM DYNAMICS | 609 |
| <i>Chairul Saleh, Ghaida Fatcha Mubienna, Taufiq Immawan, Azmi Hassan</i> | |
| DESIGN IMPROVEMENTS IN UNDERGROUND WATERING SYSTEM FOR SMALL LOCAL FARMING INDUSTRIES | 620 |
| <i>T F Ariff, N H A Tukiman, R Bahar</i> | |
| E-LEARNING APPLICATION FOR MACHINE MAINTENANCE PROCESS USING ITERATIVE METHOD IN XYZ COMPANY | 626 |
| <i>Suaidah Nurumisa, Amelia Kurniawati, Rayinda Pramuditya Soesanto, Umar Yunan Kurnia Septo Hedyanto</i> | |
| INVENTORY DECISION IN A CLOSED-LOOP SUPPLY CHAIN WITH INSPECTION, SORTING, AND WASTE DISPOSAL | 639 |
| <i>A R Dwicahyani, W A Jauhari, N A Kurdhi</i> | |

PART 2

| | |
|--|-----|
| AN INTEGER BATCH SCHEDULING MODEL FOR A SINGLE MACHINE WITH SIMULTANEOUS LEARNING AND DETERIORATION EFFECTS TO MINIMIZE TOTAL ACTUAL FLOW TIME | 650 |
| <i>R Yusriski, Sukoyo, T M A A Samadhi, A H Halim</i> | |
| THE RELATIONSHIP BETWEEN OF MANUFACTURING FLEXIBILITY, INNOVATION CAPABILITY, AND OPERATIONAL PERFORMANCE IN INDONESIAN MANUFACTURING SMES | 660 |
| <i>U. S. Purwanto, Raihan</i> | |
| A CLUSTERING CLASSIFICATION OF SPARE PARTS FOR IMPROVING INVENTORY POLICIES | 667 |
| <i>Anton Meri Lumban Raja, The Jin Ai, Ririn Diar Astanti</i> | |
| INFORMATION SYSTEM DESIGN OF INVENTORY CONTROL SPARE PARTS MAINTENANCE (VALUATION CLASS 5000) (CASE STUDY: PLANT KW) | 677 |
| <i>Rina Fitriana, Parwadi Moengin, Mega Riana</i> | |
| THE APPLICATION OF EOQ AND LEAD TIME CRASHING COST MODELS IN MATERIAL WITH LIMITED LIFE TIME (CASE STUDY: CN-235 AIRCRAFT AT PT DIRGANTARA INDONESIA) | 687 |
| <i>Yosi Agustina Hidayat, Aprilia Ria Kasanah, Titah Yudhistira</i> | |

| | |
|---|------------|
| A FRAMEWORK FOR OFFSHORE VENDOR CAPABILITY DEVELOPMENT | 696 |
| <i>Yogi Yusuf Wibisono, Rajesri Govindaraju, Dradjad Irianto, Iman Sudirman</i> | |
| PRODUCTION AND DELIVERY BATCH SCHEDULING WITH A COMMON DUE DATE AND MULTIPLE VEHICLES TO MINIMIZE TOTAL COST | 707 |
| <i>E Prasetyaningsih, Suprayogi, Tmaa Samadhi, Ah Halim</i> | |
| TECHNOLOGY ADOPTION: AN INTERACTION PERSPECTIVE | 717 |
| <i>Hotna M Sitorus, Rajesri Govindaraju, I I Wiratmadja, Iman Sudirman</i> | |
| MEASUREMENT AND DEVELOPMENT OF HUMANWARE AND TECHNOWARE COMPETENCIES IN ORDER TO MEET PINTLE CHAIN PRODUCT REQUIREMENTS IN BANDUNG MANUFACTURE POLYTECHNIC | 724 |
| <i>Jodi Akbar, Muhammad Akbar, Dradjad Irianto</i> | |
| MAKE OR BUY ANALYSIS MODEL BASED ON TOLERANCE ALLOCATION TO MINIMIZE MANUFACTURING COST AND FUZZY QUALITY LOSS..... | 730 |
| <i>C N Rosyidi, W Puspitoingrum, W A Jauhari, B Suhardi, K Hamada</i> | |
| A VARIATION REDUCTION ALLOCATION MODEL FOR QUALITY IMPROVEMENT TO MINIMIZE INVESTMENT AND QUALITY COSTS BY CONSIDERING SUPPLIERS' LEARNING CURVE..... | 739 |
| <i>C N Rosyidi, Wa Jauhari, B Suhardi, K Hamada</i> | |
| MARKETING INFORMATION SYSTEM ONLINE DESIGN FOR CRAFTSMEN SMALL MEDIUM ENTERPRISES (CASE STUDY: CRAFTSMEN AC)..... | 744 |
| <i>Rina Fitriana, Wawan Kurniawan, Anung Barlianto, Rizki Adriansyah Putra</i> | |
| ON THE APPLICATION OF COPULA IN MODELING MAINTENANCE CONTRACT | 757 |
| <i>B P Iskandar, H Husniah</i> | |
| REDESIGN OF TRANSJAKARTA BUS DRIVER'S CABIN | 765 |
| <i>Dian Mardi Safitri, Nora Azmi, Gurbinder Singh, Pudji Astuti</i> | |
| SIMULATION MODELING BY CLASSIFICATION OF PROBLEMS: A CASE OF CELLULAR MANUFACTURING..... | 772 |
| <i>K N Afiqah, Z R Mahayuddin</i> | |
| THE APPLICATION OF CONCURRENT ENGINEERING TOOLS AND DESIGN STRUCTURE MATRIX IN DESIGNING TIRE..... | 782 |
| <i>Rosnani Ginting, T Fachrozi Fitra Ramadhan</i> | |
| PRODUCT DEVELOPMENT USING QFD, MCDM AND THE COMBINATION OF THESE TWO METHODS..... | 791 |
| <i>C D Marini, N Fatchurrohman, A Azhari, S Suraya</i> | |
| INVESTIGATION OF THE PROMINENT BARRIERS TO LEAN MANUFACTURING IMPLEMENTATION IN MALAYSIAN FOOD AND BEVERAGES INDUSTRY USING RASCH MODEL | 799 |
| <i>N S Khusaini, A Ismail, A A Rashid</i> | |
| EVALUATION OF B2C WEBSITE BASED ON THE USABILITY FACTORS BY USING FUZZY AHP & HIERARCHICAL FUZZY TOPSIS | 806 |
| <i>I Masudin, T E Saputro</i> | |
| MODEL FOR ASSEMBLY LINE RE-BALANCING CONSIDERING ADDITIONAL CAPACITY AND OUTSOURCING TO FACE DEMAND FLUCTUATIONS | 814 |
| <i>Tmaa Samadhi, Atin Sumihartati</i> | |
| PRACTICAL FRAMEWORK: IMPLEMENTING OEE METHOD IN MANUFACTURING PROCESS ENVIRONMENT | 824 |
| <i>N. C. Maideen, S. Sahudin, N. H. Mohd Yahya, A. O. Norliawati</i> | |
| A METHODOLOGY FOR MANUFACTURING EXECUTION SYSTEMS (MES) IMPLEMENTATION | 835 |
| <i>Rajesri Govindaraju, Krisna Putra</i> | |
| THE DEVELOPMENT OF MODEL FOR MEASURING RAILWAY WHEELS MANUFACTURING READINESS LEVEL..... | 845 |
| <i>Iwan Inrawan Wiratmadja, Anas Mufid</i> | |
| AN INVESTIGATION OF LOW ERGONOMICS RISK AWARENESS, AMONG STAFFS AT EARLY PRODUCT DEVELOPMENT PHASE IN MALAYSIA AUTOMOTIVE INDUSTRIES..... | 852 |
| <i>Fazilah Abdul Aziz, Noraini Razali, Nur Najmiyah Jaafar</i> | |
| STUDY ON THE KEY FACTOR PARAMETERS TO INCREASE PRODUCTIVITY IN CONSTRUCTION AND MANUFACTURING INDUSTRIES..... | 865 |
| <i>K Almazyed, A Alaswad, A. G Olabi</i> | |
| COMPETING RISK MODELS IN RELIABILITY SYSTEMS, A GAMMA DISTRIBUTION MODEL WITH BAYESIAN ANALYSIS APPROACH | 870 |
| <i>Ismed Iskandar</i> | |

MATERIAL

| | |
|--|------|
| TEMPERATURE GRADIENT FIELD THEORY OF NUCLEATION | 877 |
| <i>S. Das, W. Q. Ain, A. Azhari, A. K. Prasada Rao</i> | |
| INFLUENCE OF RCS ON AL-3MG AND AL-3MG-0.25SC ALLOYS | 885 |
| <i>Prabhakar M Bhovi, K. Venkateswarlu</i> | |
| MAGNETO-RHEOLOGICAL DEFECTS AND FAILURES: A REVIEW | 892 |
| <i>Sa Wahid, I Ismail, S Aid, Msa Rahim</i> | |
| EFFECT OF B₂O₃ CONTAINING FLUXES ON THE MICROSTRUCTURE AND MECHANICAL PROPERTIES IN SUBMERGED ARC WELDED MILD STEEL PLATES | 903 |
| <i>P. Gupta, J. Roy, R. N. Rai, A. K. Prasada Rao, S. C. Saha</i> | |
| SLIDING WEAR RESPONSE OF BERYL REINFORCED ALUMINUM COMPOSITE - A FACTORIAL DESIGN APPROACH | 910 |
| <i>V. Bharat, B. Durga Prasad, M. Bhovi Prabhakar, K. Venkateswarlu</i> | |
| AL-TiH₂ COMPOSITE FOAMS MAGNESIUM ALLOY | 921 |
| <i>A. K. Prasada Rao, Y. S. Oh, W. Q. Ain, Azhari A, S. N. Basri, N. J. Kim</i> | |
| FRACTURE MICROINDENTATION ON BORIDE LAYERS ON AISI 1020 STEEL | 926 |
| <i>M. Prince, A. Justin Thanu, S. L. Arjun, U. Velmurugan, P. Gopalakrishnan</i> | |
| DEFECT DETECTION OF FIBERGLASS COMPOSITE LAMINATES (FGCL) WITH ULTRASONIC A-SCAN SIGNAL MEASUREMENT | 933 |
| <i>M. F. Mahmud, Elmi Abu Bakar, A. R. Othman</i> | |
| INVESTIGATION OF PRODUCT PERFORMANCE OF AL-METAL MATRIX COMPOSITES BRAKE DISC USING FINITE ELEMENT ANALYSIS | 940 |
| <i>N. Fatchurrohman, C. D. Marini, S. Suraya, Akm. Asif Iqbal</i> | |
| THE EFFECT OF HEAT TREATMENT ON THE HARDNESS AND IMPACT PROPERTIES OF MEDIUM CARBON STEEL | 948 |
| <i>Noor Mazni Ismail, Nurul Aida Amir Khatif, Mohamad Aliff Kamil Awang Kekik, Mohd Ali Hanafiah Shaharudin</i> | |
| A STUDY ON THE INFLUENCE OF PROCESS PARAMETERS ON THE MECHANICAL PROPERTIES OF 3D PRINTED ABS COMPOSITE | 957 |
| <i>K. G. Jaya Christiyana, U. Chandrasekhar, K. Venkateswarlu</i> | |
| EFFECT OF AL₂O₃ NANOLUBRICATION WITH SODIUM DODECYLBENZENE SULFONATE (SDBS) ON SURFACE ROUGHNESS AND TOOL WEAR UNDER MQL DURING TURNING OF TI-6AL-4Ti | 965 |
| <i>M. A. M. Ali, A. N. M. Khalil, A. I. Azmi</i> | |
| COATED CARBIDE DRILL PERFORMANCE UNDER SOLUBLE COCONUT OIL LUBRICANT AND NANOPARTICLE ENHANCED MQL IN DRILLING AISI P20 | 971 |
| <i>N. A. M. Jamil, A. I. Azmi, M. A. Fairuz</i> | |
| INFLUENCE OF NORMAL LOADS AND SLIDING VELOCITIES ON FRICTION PROPERTIES OF ENGINEERING PLASTICS SLIDING AGAINST ROUGH COUNTERFACES | 977 |
| <i>D. M. Nuruzzaman, M. A. Chowdhury, M. L. Rahaman, A. N. Oumer</i> | |
| EROSIVE WEAR CHARACTERISTICS OF MULTI-FIBER REINFORCED POLYESTER UNDER DIFFERENT OPERATING CONDITIONS | 985 |
| <i>U. K. Debnath, M. A. Chowdhury, D. M. Nuruzzaman</i> | |
| PURIFICATION OF TRONOH SILICA SAND VIA PRELIMINARY PROCESS OF MECHANICAL MILLING | 994 |
| <i>Nazratulhuda H, Othman M</i> | |
| ANALYSIS OF FATIGUE CRACK PROPAGATION BEHAVIOUR IN SIC PARTICULATE AL₂O₃ WHISKER REINFORCED HYBRID MMC | 1001 |
| <i>Akm. Asif Iqbal, Yoshio Arai</i> | |
| EFFECT OF SPUTTERING TARGET'S GRAIN SIZE ON THE SPUTTERING YIELD, PARTICLE SIZE AND COERCIVITY (HC) OF NI AND NI20AL THIN FILMS | 1011 |
| <i>M. Reza, Z. Sajuri, J. Yunas, J. Syarif</i> | |
| SILICANIZING PROCESS ON MILD STEEL SUBSTRATE BY USING TRONOH SILICA SAND: MICROSTRUCTURE, COMPOSITION AND COATING GROWTH | 1017 |
| <i>Yusnenti F. M. Y, Othman M, Mazli Mustapha, Mohd Yusri I</i> | |
| EXPERIMENTAL INVESTIGATION ON THE MECHANICAL PROPERTIES OF GLASS FIBER REINFORCED NYLON | 1024 |
| <i>D. M. Nuruzzaman, A. K. M. Asif Iqbal, A. N. Oumer, N. M. Ismail, S. Basri</i> | |
| EFFECT OF LOW TEMPERATURE ANNEALING ON THE WEAR PROPERTIES OF NITINOL | 1031 |
| <i>Sriram Mukunda, Narendra Nath. S, Mervin A. Herbert, P. G. Mukunda</i> | |

| | |
|--|------|
| MICROSTRUCTURE AND MECHANICAL PROPERTIES INVESTIGATION OF IN SITU TiB₂ AND ZrB₂ REINFORCED AL-4Cu COMPOSITES..... | 1044 |
| <i>Ahmad Lutfi Anis, Rosmanuhammadani Ramli, Widyani Darham, Azlan Zakaria, Mahesh Kumar Talari</i> | |
| EXPERIMENTAL INVESTIGATION AND OPTIMIZATION OF RESPONSE VARIABLES IN WEDM OF INCONEL - 718..... | 1049 |
| <i>S S Karidkar, U A Dabade</i> | |
| MULTI-OBJECTIVE OPTIMIZATION IN HOT MACHINING OF AL/SiCp METAL MATRIX COMPOSITES..... | 1057 |
| <i>M R Jadhav, U A Dabade</i> | |
| PROCESSING AND MECHANICAL PROPERTIES OF ALUMINIUM-SILICON CARBIDE METAL MATRIX COMPOSITES..... | 1067 |
| <i>D M Nuruzzaman, F F B Kamaruzaman</i> | |
| INVESTIGATION ON THE THERMAL PROPERTIES, DENSITY AND DEGRADATION OF QUATERNARY IRON AND TITANIUM PHOSPHATE BASED GLASSES..... | 1074 |
| <i>Sis Shaharuddin, I Ahmed, D Furniss, Aj Parsons, Cd Rudd</i> | |
| INVESTIGATION ON MICROSTRUCTURE AND MECHANICAL PROPERTIES OF FRICTION STIR WELDED AA6061-4.5Cu-10SiC COMPOSITE..... | 1084 |
| <i>Mervin A. Herbert, Arun Kumar Shettigar, Akshay V Nigalye, Shrikantha S. Rao</i> | |
| RESISTANCE SPOT WELDING OF AA5052 SHEET METAL OF DISSIMILAR THICKNESS..... | 1093 |
| <i>N A Mat Din, H Zuhailawati, A S Anasyida</i> | |
| EFFECT OF SOLUTION TREATMENT ON AL 1100 CRYOROLLED SHEET ALLOY..... | 1101 |
| <i>Z. S. Aminah, S. A. S. M. Noraini, H. Zuhailawati, A. S. Anasyida</i> | |
| PREDICTING EFFECTS OF CORROSION EROSION OF HIGH STRENGTH STEEL PIPELINES ELBOW ON CO₂-ACETIC ACID (HAC) SOLUTION..... | 1108 |
| <i>Y. P. Asmara, M. F. Ismail, L. Giok Chui, Jamiludin Halimi</i> | |
| CLADDING OF Mg ALLOY WITH Zr BASED BMG ALLOY..... | 1113 |
| <i>A. K. Prasada Rao, Y. S. Oh, M. K. Faisal, N. J. Kim</i> | |
| NUMERICAL FRACTURE ANALYSIS OF CRYOGENICALLY TREATED ALLOY STEEL WELDMENTS..... | 1117 |
| <i>S Rasool Mohideen, S Thamizhmanii, M. M Muhammed Abdul Fatah, W. Najmuddin W. Saidin</i> | |

AUTOMATION

| | |
|---|------|
| AGE RELATED DIFFERENCES IN THE SURFACE EMG SIGNALS ON ADOLESCENT'S MUSCLE DURING CONTRACTION..... | 1128 |
| <i>Nizam Uddin Ahamed, Zahari Taha, Mahdi Alqahtani, Omar Altwijri, Matiur Rahman, Abdelhakim Deboucha</i> | |
| TOOL BREAKAGE DETECTION FROM 2D WORKPIECE PROFILE USING VISION METHOD..... | 1134 |
| <i>W K Lee, M M Ratnam, Z A Ahmad</i> | |
| A HYBRID JOINT BASED CONTROLLER FOR AN UPPER EXTREMITY EXOSKELETON..... | 1142 |
| <i>Ismail Mohd Khairuddin, Zahari Taha, Anwar P. P. Abdul Majeed, Abdel Hakeem Deboucha, Mohd Azraai Mohd Razman, Abdul Aziz Jaafar, Zulkifli Mohamed</i> | |
| MODELLING AND CONTROL OF AN UPPER EXTREMITY EXOSKELETON FOR REHABILITATION..... | 1150 |
| <i>Zahari Taha, Anwar P. P. Abdul Majeed, Mohd Yashim Wong Paul Tze, Mohammed Abdo Hashem, Ismail Mohd Khairuddin, Mohd Azraai Mohd Razman</i> | |
| SENSORS FUSION BASED ONLINE MAPPING AND FEATURES EXTRACTION OF MOBILE ROBOT IN THE ROAD FOLLOWING AND ROUNDABOUT..... | 1158 |
| <i>Mohammed A H Ali, Musa Mailah, Wan Azhar B. Yussof, Zamzuri B Hamedon, Zulkifli B. Yussof, Anwar P P Majeed</i> | |
| AN INTELLIGENT ACTIVE FORCE CONTROL ALGORITHM TO CONTROL AN UPPER EXTREMITY EXOSKELETON FOR MOTOR RECOVERY..... | 1170 |
| <i>Wan Hasbullah Mohd Isa, Zahari Taha, Ismail Mohd Khairuddin, Anwar P. P. Abdul Majeed, Khairul Fikri Muhammad, Mohammed Abdo Hashem, Jamaluddin Mahmud, Zulkifli Mohamed</i> | |
| MODELLING OF PHOTOVOLTAIC MODULE USING MATLAB SIMULINK..... | 1179 |
| <i>Nurul Afiqah Zainal, Ajisman, Ahmad Razlan Yusoff</i> | |
| FUZZY LOGIC CONTROLLED SOLAR MODULE FOR DRIVING THREE- PHASE INDUCTION MOTOR..... | 1188 |
| <i>Nurul Afiqah Zainal, Chan Sooi Tat, Ajisman</i> | |
| LOW COST NIGHT VISION SYSTEM FOR INTRUDER DETECTION..... | 1195 |
| <i>Liang S Ng, Wan Azhar Wan Yusoff, Dhinesh R, J S Sak</i> | |

| | |
|--|-------------|
| FEATURE IDENTIFICATION AND FILTERING FOR ENGINE MISFIRE DETECTION (EMD) USING ZIRCONIA OXYGEN SENSOR | 1204 |
| <i>Muhammad Zaim Mohamed Pauzi, Elmi Abu Bakar, Mohd Fauzi Ismail</i> | |
| GEOMETRICAL ANALYSIS ON CAP-SHAPED COILS FOR POWER OPTIMIZATION OF THE VIBRATION-BASED ELECTROMAGNETIC HARVESTING SYSTEM | 1210 |
| <i>Wan Hasbullah Mohd Isa, Khairul Fikri Muhammad, Ismail Mohd Khairuddin, Ismayuzri Ishak, Ahmad Razlan Yusoff</i> | |
| OPEN SOURCE HARDWARE AND SOFTWARE PLATFORM FOR ROBOTICS AND ARTIFICIAL INTELLIGENCE APPLICATIONS | 1216 |
| <i>S Ng Liang, K O Tan, T H Lai Clement, S K Ng, A H Ali Mohammed, Musa Mailah, Wan Azhar Yussof, Zamzuri Hamedon, Zulkifli Yussof</i> | |
| THE ONE UNIVERSAL GRAPH — A FREE AND OPEN GRAPH DATABASE | 1226 |
| <i>Liang S. Ng, Corbin Champion</i> | |
| CELLULAR MANUFACTURING SYSTEM WITH DYNAMIC LOT SIZE MATERIAL HANDLING | 1243 |
| <i>M. S. A. Khannan, A. Maruf, R. Wangsaputra, S. Sutrisno, T. Wibawa</i> | |
| FUNDAMENTAL STUDIES ON DEVELOPMENT OF MHD (MAGNETOHYDRODYNAMIC) GENERATOR IMPLEMENT ON WAVE ENERGY HARVESTING | 1251 |
| <i>M. F. M. A. Majid, Muhamad Al-Hakim Md Apandi, M. Sabri, K. Shahril</i> | |
| RFID-BASED AUTOMATIC BUS TICKETING: FEATURES AND TRENDS | 1260 |
| <i>A. Oudah</i> | |
| THE ROUTE ANALYSIS BASED ON FLIGHT PLAN | 1270 |
| <i>Nur Feriyanto, Chairul Saleh, Achmad Fauzi, Nur Rachman Dzakiyullah, Kahfi Riza Iwaputra</i> | |
| CARBON DIOXIDE EMISSION PREDICTION USING SUPPORT VECTOR MACHINE | 1281 |
| <i>Chairul Saleh, Nur Rachman Dzakiyullah, Jonathan Bayu Nugroho</i> | |
| DYNAMIC CURVATURE STEERING CONTROL FOR AUTONOMOUS VEHICLE: PERFORMANCE ANALYSIS | 1289 |
| <i>Muhammad Azzat Zakaria, Hairi Zamzuri, Saiful Amri Mazlan</i> | |
| DEVELOPMENT OF A WORKING HOVERCRAFT MODEL | 1296 |
| <i>S H Mohamed Noor, K Syam, A A Jaafar, M F Mohamad Sharif, M R Ghazali, W I Ibrahim, M F Atan</i> | |
| DEVELOPMENT OF UNIVERSAL PORTABLE SPRAY STAND FOR TOUCH-UP PROCESS IN THE AUTOMOTIVE PAINTSHOP | 1305 |
| <i>Muhammed Abdul Fatah Muhamed Mukhtar, Rasool Mohideen Shahul Hameed</i> | |
| Author Index | |