

Thursday, April 23

Time	Plenary Room	Room A	Room B	Room C	Room D	Room E
9:00-9:15	Opening					
9:15-10:00	INV-1 FUNCTIONAL COATINGS FOR TRIBOLOGICAL APPLICATIONS Dae-Eun Kim Yonsei University, Korea					
10:00-10:30	KN-1 DEVELOPMENT OF LIFE SUPPORT DEVICES USING INCLUSIVE DESIGN Eiichirou Tanaka Saitama University, Japan					
10:30-10:45	Group Photo/Break					
10:45-12:15		<b>Machine Elements (1) (Joint, Bolt)</b>	<b>Coatings and Surface Modification (1)</b>	<b>Machine Design (1)</b>	<b>Hydraulic/Functional Fluid Actuators</b>	<b>Manufacturing Systems</b>
		3002 NOVEL JOINT APPLICABLE IN OFF-CENTERED CONDITION Keiji Imado1, Kiyoshi Terada1, Thomas Harran1 1 Oita University, Japan	3010 SURFACE CHARACTERISTICS OF PLASMA NITRIDED 12% CHROME STEELS Lyta Liem1, Farid Triawan1, Hideaki Maeda1 1 Torishima Pump Mfg. Co., Ltd., Japan	3142 XY AND Z SCANNER DEVELOPMENT FOR HIGH ACCURACY ATOMIC FORCE MICROSCOPE Byoung-Woon Ahn1, Hyun-Suk Oh1, Ah-jin Jo1, Sang-Joon Cho1, Sang-il Park1 1 Park systems Corp. R&D center, Korea	3237 MULTI-PHYSICS ANALYSIS OF THE ELECTRO-HYDRAULIC SERVO VALVE So-Nam Yun1, In-Seob Park1, Young-Bog Ham1, Hyun-Cheol Lee2 1 Korea Institute of Machinery & Materials, 2 SG Servo, Korea	3080 SHARING 3D DESIGN MODEL IN REAL-TIME CONFERENCE AND FACILITATE DECISION MAKING IN COLLABORATIVE DESIGN PROCESS BY WEB FRAMEWORK Jiaqi Lu1, Seongho Kim1, Hyun-Tae Hwang1, Soo-Hong Lee1 1 Yonsei University, Korea
		3084 TIGHTENING RELIABILITY USING ELLIPTICAL CONFIDENCE LIMIT Soichi Hareyama1, Ken-ichi Manabe1 1 Tokyo Metropolitan University, Japan	3013 IMPROVEMENT IN ADHESIVE PROPERTY OF DLC FILM COATED ON INNER SURFACE OF NARROW METAL TUBE BY MVP METHOD Yoshihiko Hagiyama1, Hiroyuki Kousaka1, Noritsugu Umehara1 1 Nagoya University, Japan	3143 RESEARCH ON DRIVE MECHANISM OF LEVELING MACHINE FOR SEEDING BED Kazuhiro Iwata1, Yoshio Tsuji1, Akira Sanada1, Hideyuki Kanashima2 1 Industrial Technology Center of Okayama Prefecture, 2 MINORU Industrial Co., Ltd., Japan	3059 EXPERIMENTAL ANALYSIS OF WATER PUMP DRIVING MECHANISM USING ORTHOGONAL DOUBLE-SLIDER JOINT Jun Nango1, Toshiomi Koguchi1, Takumi Yoshizawa2 1 Yamagata University, 2 Z Mechanism Technical research center Co.,Ltd., Japan	3275 KINEMATIC ANALYSIS OF UNDERACTUATED SPATIAL PARALLEL MECHANISM WITH ELASTIC ELEMENTS FOR FLEXIBLE MULTI-DOF JOINTS Nobuyuki Iwatsuki1, Ikuma Ikeda1, Takahiro Suwa1 1 Tokyo Institute of Technology, Japan
		3085 LIFETIME PREDICTION TO FATIGUE AND LOOSENING FAILURE OF BOLTED JOINT Soichi Hareyama1, Ken-ichi Manabe1 1 Tokyo Metropolitan University, Japan	3019 TORQUE REDUCTION TECHNOLOGY OF OIL SEALING SYSTEM BY SURFACE COATING Takeshi Kunishima1, Takeshi Kawabayashi1, Takatori Kurokawa1, Hirokazu Arai1 1 JTEKT Corporation, Japan	3167 DESIGN OF ULTRASONIC VIBRATOR FOR DENTAL SURGERY USING FEA Ki-Moon Park1, Tae Jo Ko1 1 Yeungnam University, Korea	3103 DIRECT DRIVE VOLUME CONTROL ACTUATOR FOR FUEL INJECTION SYSTEM OF MARINE DIESEL ENGINES Kazushi Sanada1 1 Yokohama National University, Japan	3173 INTERNAL STRESS ANALYSIS OF WOUND ROLL CONSIDERING FILM THICKNESS VARIATION AND ELASTIC DEFORMATION Seiya Iiyama1, Hikaru Sugii1, Yuta Sunami1, Hiromu Hashimoto1 1 Tokai University, Japan
		3092 SELF-LOOSENING BEHAVIOUR OF MULTI-BOLTED JOINTS - REQUIREMENTS FOR ENGINEERING DESIGN IN REAL APPLICATIONS Shiva Kumar Manoharan1, Christoph Friedrich1 1 University of Siegen, Germany	3026 EFFECT OF TEMPERATURE AND COUNTERPART MATERIAL ON WEAR PROPERTY OF CNx AND DLC Takuya Yamanouchi1, Yukio Tanaka2, Shingo Kawara1, Deng Xingrui1, Noritsugu Umehara1, Hiroyuki Kousaka1 1 Nagoya University, 2 Torishima Pump Mfg. Co., Ltd., Japan	3213 DEVELOPMENT OF THE MOTION ASSISTANCE APPARATUS FOR THE PROMOTION OF EXERCISE FOR THE ELDERLY Eiichirou Tanaka1, Ryosuke Niwa2, Kazuki Osawa2, Keiichi Watanuki1, Keiichi Muramatsu1, Shozo Saegusa3, Louis Yuge4 1 Saitama University, 2 Shibaura Institute of Technology, 3 Shujitsu University, 4 Hiroshima University, Japan	3111 MAGNETO-RHEOLOGICAL DAMPER MODELING AND APPLICATION TO SENSORLESS FORCE DAMPING CONTROL SYSTEM Dao Thanh Liem1, Dinh Quang Truong1, Kyoung Kwan Ahn1 1 University of Ulsan, Korea	3256 A STUDY ON THE ENERGY CONSUMPTION OF MACHINE TOOLS EACH AXIS BY MACHINING STRATEGIES Jae-Hyeok Kim1, Oscar Velasquez Arriaza1, Eun-Young Heo2, Cheol-Soo Lee2, Dong-Yoon Lee1 1 Korea Institute of Industrial Technology, 2 Sogang University, Korea
		3045 ON THE THREAD TORQUE INDUCED BY THE SLIPPAGE AT MATING THREADS IN BOLT/NUT ASSEMBLY UNDER REPEATED TENSILE LOADING Masaya Hagiwara1, Fuyuhiko Ikezawa1 1 Nagoya Institute of Technology, Japan	3044 THE EFFECT OF CONTACT LENGTH ON FRICTION FORCE OF LOOPED CARBON FIBER BRUSH WHEN IT STARTS SLIDING Takuya Shitaka1, Yosuke Tsukiyama2, Isami Nitta2, Noritsugu Umehara1, Shingo Kawara1, Hiroyuki Kousaka1, Deng Xingrui1 1 Nagoya University, 2 Niigata University, Japan	3248 AIMING ERROR ANALYSIS OF THE GUN ON THE RUNNING GROUND COMBAT VEHICLE ON THE BUMPY ROAD Kang Park1, Jae-Bok Song1, and Sang-Young Choi1 1 Myongji University, Korea	3099 A NOVEL 3D-PRINTED FINGER INTEGRATED WITH ECF MICROPUMP Dong Han1, Hongri Gu1, Joon-wan Kim1, Shinichi Yokota1, Kazuya Edamura2 1 Tokyo Institute of Technology, 2 New Technology Management Co., Ltd., Japan	
		3171 OPTIMAL DESIGN OF VISION ILLUMINATION OPTICS FOR INSPECTION OF SCREW THREADS Keun Park1, Seung-Woo Ra2 1 Seoul National University of Science and Technology, 2 Seoul Metal Co., Korea	3046 ANALYSIS OF WEAR TRACK ON DLC AFTER SLIDING WITH MoDTC CONTAINING LUBRICANTS Kentaro Omura1, Kenji Ohara2, Kiyoshi Hanyuda2, Yasushi Kawamura2, Noritsugu Umehara1, Hiroyuki Kousaka1, Deng Xingrui1 1 Nagoya University, 2 Showa Shell Sekiyu K.K., Japan		3262 PROPOSAL OF DRIE-FABRICATED SILICON ELECTRODE PAIRS FOR ECF MICROPUMPS Misaki Shimizu1, Joon-wan Kim1, Shinichi Yokota1, Kazuya Edamura2 1 Tokyo Institute of Technology, 2 New Technology Management Co., Ltd., Japan	
12:15-13:15	Lunch					
13:15-14:15	Poster Session					
14:15-14:30	Break					
14:30-15:00	KN-2 NAO ASK ROBIN PROJECT: EMPLOYING HUMANOID ROBOT NAO AS A TOOL TO ASSIST EMOTION RECOGNITION FOR CHILDREN WITH AUTISM SPECTRUM DISORDER (ASD) Hanafah Yussuf, Syamimi Shamsuddin, Mohd Azfar Miskam Universiti Teknologi MARA, Malaysia					
15:15-16:45		<b>Machine Elements (2) (Bearing, others)</b>	<b>Coatings and Surface Modification (2)</b>	<b>Machine Design (2)</b>	<b>Pneumatic Actuators</b>	<b>Product and Process Design (IPPD)</b>
		3003 COMPREHENSIVE EVALUATION FOR PERFORMANCE OF BALL BEARING HAVING CEREMICS ROLLING ELEMENTS (ELECTRICAL PITTING, VIBRATION ACCELERATION, INTERNAL WEAR AND DEGRATION OF GREASE) Shoji Noguchi1, Tohru Kanada2 1 Tokyo University of Science, 2 Kanto Gakuin University, Japan	3048 IN-SITU OBSERVATION OF TRANSFORMED LAYER IN THE FRICTION AREA OF a-C:H SLIDING AGAINST NAPPHIRE (a-AI2O3) Hidenori Nishimura1, Noritsugu Umehara1, Hiroyuki Kousaka1 and Xingrui Deng1 1 Nagoya University, Japan	3276 EVALUATION OF THE WALKING ASSISTANCE APPARATUS FOR PRACTICAL USE Eiichirou Tanaka1, Ryosuke Niwa2, Shozo Saegusa3, Louis Yuge4 1 Saitama University, 2 Shibaura Institute of Technology, 3 Shujitsu University, 4 Hiroshima University, Japan	3034 DISPLACEMENT AND GRIPPING DETECTION BY PIEZOELECTRIC POLYMER SENSORS FOR SOFT ACTUATORS Yusuke Okamoto1, Takefumi Kanda1, Shuichi Wakimoto1, Koichi Suzumori2 1 Okayama University, 2 Tokyo Institute of Technology, Japan	3208 AN INDUCTIVE ROBUST DESIGN METHOD FOR MULTI-LEVEL PRODUCT DESIGN Sungwoo Jang1, Hae-Jin Choi1 1 Chung-Ang University, Korea
		3005 INFLUENCE OF MANUFACTURING PROCESS ON ROLLING FATIGUE OF STEEL BALL Ryosuke Ano1, Masahiro Fujii2, Hiroshi Ohsaki1 1 Amatsuji Steel Ball Mfg.Co.,Ltd., 2 Okayama University, Japan	3093 DISCUSSION OF SUPER LOW FRICTION MECHANISM OF CNx COATING SLIDING AGAINST CNx IN OIL Kazuyuki Ichimura1, Noritsugu Umehara1, Kenji Ishikawa1 1 Nagoya University, Japan	3028 DIGITAL MODELING AND MANUFACTURE OF PLANETARY GEAR DRIVE USING CIRCULAR-ARC TOOTH-TRACE GEARS Keiji Sonoda1, Kazuki Takenouchi2, Shigetaka Iketani3 1 Sojo University, 2 Kyushu University, 3 Yutaka Seimitsu Kogyo, Ltd., Japan	3065 FABRICATION AND EVALUATION OF SOFT FILM ACTUATOR FOR LOW TEMPERATURE ENVIRONMENT Daisuke Yamaguchi1, Tatsuya Hanaki1, Yuji Ishino1, Masayuki Hara1, Masaya Takasaki1, Takeshi Mizuno1 1 Saitama University, Japan	3209 A STRATEGIC CONCEPT SELECTION METHOD UNDER UNCERTAINTY IN CUSTOMER'S REQUIREMENTS Soonyoung Han1, Hae-Jin Choi1 1 Chung-Ang University, Korea
		3246 REDUCED ORDERED MODELING OF ROTOR-OIL FILM BEARING SYSTEM BY FILTERING LARGE EIGENVALUES FOR HARDWARE-IN-THE-LOOP SIMULATOR Wataru Tsunoda1, Wataru Hijikata1, Tadahiko Shinshi1, Hiroyuki Fujiwara2, Osami Matsushita2 1 Tokyo Institute of Technology, 2 National Defense Academy, Japan	3115 RESEARCH ON THERMAL STABILITY OF DLC BY USING IN-SITU ENVIRONMENTAL SCANNING ELECTRON MICROSCOPE Xingrui Deng1, Hiroto Izuoka1, Hiroyuki Kousaka1, Noritsugu Umehara1 1 Nagoya University, Japan	3055 ACTIVELY CONTROLLED VARIABLE DISPLACEMENT VANE PUMP FOR ENGINE LUBRICATION Bui Ngoc Minh Truong1, Dinh Quang Truong1, To Xuan Dinh1, Kyoung Kwan Ahn1, Jae Shin Lee1 1 University of Ulsan, Korea	3087 MULTIFUNCTIONAL FINGER JOINTS REHABILITATION DEVICE USING PNEUMATIC SOFT ACTUATORS Hironari Taniguchi1, Yusuke Naito1 1 National Institute of Technology, Ahn1, Tsuyama College, Japan	3233 VERIFICATION OF PRODUCT DESIGN USING REGULATION KNOWLEDGEBASE AND WEB SERVICE Ikjune Kim1, Byung Chul Kim2, Duhwan Mun3 1 Korea Atomic Energy Research Institute, 2 Dong-A University, 3 Kyungpook National University, Korea
		3186 DETERMINATION OF ACTIVE NUMBER OF HELICAL COIL SPRING UNDER COMPRESSIVE LOAD CONDITION Yu Lim Kim1, Sung Hoon Kim2, Seong Won Choi3, Kyu Zong Cho4 1 Chonnam National University, 2 Nambu University, 3 ENS Ing, 4 Chonnam National University, Korea	3128 EFFECTS OF RESIDUAL GASES DURING DEPOSITION ON THE FRICTION PROPERTIES OF Si-CONTAINING A-C:H FILMS Hotaka Shibusawa1, Hiroyuki Kousaka1, Noritsugu Umehara1, Xingrui Deng1 1 Nagoya University, 2 CREST, Japan Science and Technology Agency, Japan	3135 ESTIMATION OF RADIAL PRESSURE AND STEM RESISTANCE FORCE ON A GLAND PACKING Shinichi Enoki1, Shingo Murakami1, Masahiro Ueno2, Shun Kawai2 1 National Institute of Technology, Nara College, 2 DEGIC Co., Ltd., Japan	3050 PRESSURE CONTROL OF A MINIATURE RUBBER MUSCLE DRIVEN BY GAS-LIQUID PHASE-CHANGE Mingzhao Cheng1, Tomonori Kato1, Shunta Honda1, Kazuki Sakuragi1, Manabu Ono2 1 Fukuoka Institute of Technology, 2 Tokyo Metropolitan College of Industrial Technology, Japan	3162 AN INVESTIGATION INTO THE FASTENING PERFORMANCE OF A SERRATION BOLT Jin-Han Jung1, Hyun-Kyu Lee1, Seung-Woo Ra2, Jong-Bong Kim1 1 Seoul National University of Science and Technology, 2 Seoul Metal, Korea
		3282 STUDY ON PHOTOVOLTAIC DEVICES FOR INCREASING GENERATION EFFICIENCY Jin-Won Chang1, Saeng-Soo Kim1, Jun-Ho Bang1, Jong-Jo Lee1 1 Chonbuk National University, 2 Chonbuk National University, Korea	3192 THE ROLE OF METAL-RICH TRIBOFILM ON THE LOAD DEPENDENT FRICTION BEHAVIOR OF METAL DIAMONDLIKE-CARBON NANO-COMPOSITE COATINGS Minoru Goto1, Julien Fontaine2, Kosuke Ito3, Takatori Takeno4, Hiroyuki Miki4 1 Ube National College of Technology, Japan, 2 Ecole Centrale de Lyon, France, 3 Nihon University, 4 Tohoku University, Japan	3069 A RESEARCH ABOUT UTILIZING THE GENERALIZED SURGICAL PROCESS MODEL WITH SURGICAL WORKFLOW MANAGER Hyun-Tae Hwang1, Woong Yang1, Soo-Hong Lee1, Myon Woong Park2, Young Tae Sohn2, Jae Kwan Kim2, Dahee Jung2 1 Yonsei University, 2 Korea Institute of Science and Technology, Korea	3200 RESEARCH ON CONTROLLABILITY OF THE PARTICLE EXCITATION FLOW CONTROL VALVE Daisuke Hirooka1, Tomomi Yamaguchi1, Naomichi Furushiro1, Koichi Suzumori2, Takefumi Kanda3 1 Kansai University, 2 Tokyo Institute of Technology, 3 Okayama University, Japan	3199 EVALUATION ON THE JOINING STRENGTH OF FIBER METAL LAMINATES AND ALUMINUM ALLOY 5052 JOINED BY TAPERED-HOLE CLINCHING Dong-Sik Kang1, Byoung-Eon Lee1, Eu-Teum Park1, Jeong Kim1, Beom-Soo Kang1, Woo-Jin Song1 1 Pusan National University, Korea
				3207 A METHOD FOR PERSISTENT IDENTIFICATION OF TOPOLOGICAL ENTITIES IN A PARAMETRIC CAD Shahjadi Hisan Farjana1, Duhwan Mun2, Soonhung Han1 1 KAIST, 2 Kyungpook National University, Korea	3239 ANALYSIS OF FLOW CONTROL SERVO VALVE THROUGH MATHEMATICAL MODELING Ji-U Kim1, Hang-Bong Shin2, Jung-Ho Park1, So-Nam Yun1 1 Korea Institute of Machinery & Materials(KIMM), 2 SG Servo, Korea	3123 FULL THREE DIMENSIONAL LAYERS FOR 5-AXIS 3D METAL PRINTING Kyubok Lee1, Haeseong Jee1 1 Hongik University, Korea
16:45-17:00	Break					

Micro/Nano Processing/ Micro/Nano Tribology	Friction and Wear Mechanism	Machine Design (3)	Pneumatic / Other Actuators	Injection Molding/ Printing Technology for Manufacturing
3014 THE EFFECT OF TEXTURING AND WETTABILITY ON GROWTH OF FROST Takayuki Tokoroyama1, Shinpei Ito1 1 Akita University, Japan	3236 RELATIONSHIP BETWEEN FRICTION FORCE AND REAL CONTACT AREA OBSERVED BY LASER MICROSCOPE WITH WIDE FIELD OF VIEW Yosuke Tsukiyama1, Naoya Fukuda2, Isami Nitta1 1 Niigata University, Japan	3089 CFD SIMULATION OF MULTI-PHASE MIXING FLOW IN MUD MIXING SYSTEM Tae-Young Kim1, Jong-Chun Park1 1 Pusan National University, Korea	3175 NEW GAS RUBBER ACTUATOR DRIVEN WITH ELECTROLYSIS/SYNTHESIS OF WATER Akira Wada1, Koichi Suzumori1, Hidehiro Kametani2, Takaaki Kitamori1, Shunichi Wakimoto2 1 Tokyo Institute of Technology, 2 Okayama University, Japan	3008 PROPOSAL FOR EVALUATION METHOD FOR AESTHETIC SURFACE OF CFRP WITH ELLIPSO METER Takayuki Kawasaki1, Motoyuki Murashima1, Noritsugu Umehara1, Hiroyuki Kousaka1 1 Nagoya University, Japan
3066 SUPERHYDROPHOBIC HIERARCHICAL STRUCTURES PRODUCED BY NOVEL LOW-COST STAMP FABRICATION AND HOT-EMBOSSING OF THERMOPLASTIC FILM Sol-Yi Han1, Chae-Hee Lim1, Jae-Dong Eo2, Gwang Kim1, Wook-Bae Kim1 1 Korea Polytechnic University, 2 SND Engineering, Korea	3170 INVESTIGATION OF FRICTION INCREMENT BETWEEN TWO FILM SURFACES BY ELECTRIC FIELD Jeonggoo Kang1, Hyunduk Shin1, Jeha Ryu1 1 Gwangju Institute of Science and Technology, Korea	3197 SIMULATION FOR PENETRATION OF SHAPED CHARGE UNDER INTENSE ELECTRIC CURRENT PULSE Hyeong Gyu Park1, Dong Kyu Kim2, Si Woo Kim2, Jae Hyun Joo2, Woo Jin Song1, Jeong Kim1 1 Pusan National University, 2 Agency for Defense Development, Korea	3094 DEVELOPMENT OF AN ADSORPTION SUCTION CUP WITH INTEGRATED MICRO SUCTION CUPS Takao Hishikawa1, Shuichi Wakimoto1, Koichi Suzumori2 1 Okayama University, 2 Tokyo Institute of Technology, Japan	3226 MANUFACTURE OF LARGE SIZED FLAT PANEL AIRLIFT PHOTOBIOREACTOR (FP PBR) CASE WITH CHARACTERISTIC SHAPE USING THERMOFORMING PROCESS Ho-Jin Lee1, Dong-Gyu Ahn1 1 Chosun University, Korea
3112 FUNDAMENTAL STUDY ON THE MECHANICAL PROPERTIES OF MULTI-LAYER GRAPHENE STRUCTURE Kuk-Jin Seo1, Hyun-Joon Kim2, Dae-Eun Kim1 1 Yonsei University, 2 Kyungpook National University, Korea	3193 EROSION WEAR MECHANISMS OF METAL ON FINE PARTICLE PEENING PROCESS Koichiro Nambu1, Hitoshi Toya2, Hatsuhiro Usami2, Yukio Takizawa3, Keju Chou3, Yoshikazu Yamada4, Masafumi Ando4 1 Suzuka national college of Technology, 2 Meijo University, 3 Itoh Kikoh Co., LTD., 4 IKK Shot Co., LTD, Japan	3279 POLYMER MECHANISMS AND THEIR APPLICATIONS Mikio HORIE1 1 Tokyo Institute of Technology, Japan	3134 RELATIONSHIP BETWEEN FLAPPING MOTION AND AERODYNAMIC FORCE OF DRAGONFLY Fuma Sakai1, Hiromu Hashimoto1 1 Tokai University, Japan	3235 FABRICATION OF A SUS 316L THREADED ELBOW FITTING BY METAL INJECTION MOLDING Jaeyoung Kim1, Seokyoung Ahn1 1 Pusan National University, Korea
3160 A STUDY ON SURFACE MORPHOLOGY OF A TRIBOELECTRIC NANOGENERATOR BASED ON CONTACT-SEPARATION MODE M. A. Parvez Mahmud1, Jae Jong Lee1,2, Kee-Bong Choi1,2 1 University of Science and Technology, 2 Korea Institute of Machinery and Materials, Korea	3245 WEAR MODE TRANSITION OF POLYAMIDE 66 RESINS FILLED WITH HARD PARTICULATE OR FIBROUS FILLER Kei Shibata1, Moeko Kishi1, Mei Fukuda1, Takeshi Yamaguchi1, Kazuo Hokkirigawa1 1 Tohoku University, Japan	3187 DEFORMATION BEHAVIOR OF AL6061-T6 UNDER COMPRESSIVE IMPACT TEST USING SPLIT HOPKINSON PRESSURE BAR Woo-jin An1, Min-a Woo1, Hak-gon Noh1, Jeong Kim1 1 Pusan National University, Korea	3095 DEVELOPMENT OF A FUNCTIONAL RUBBER SHEET WITH HYDROPHILIC AND HYDROPHOBIC MATERIALS FOR HANDLING A DROPLET Kazuyuki Shimogawa1, Shuichi Wakimoto1, Koichi Suzumori2 and Yoshihisa Morishige1 1 Okayama University, 2 Tokyo Institute of Technology, Japan	3165 DEVELOPMENT OF R2R CYLINDRICAL BED SCREEN PRINTING SYSTEM WITH DAMPED MOTORIZING ACCUMULATOR AND VIRTUAL KEY-KEY ALIGN CONTROL ALGORITHM JangHwan Lee1,2, OkJin Kim1, YoungMin Lee1,2, YoungJin Kim1, TaeSu Chun1, YongRak Choi2, KiTaek Kim2, JaeWoong Yu2, DongKwon Choi1 1 Sung An Machinery Co.,Ltd., 2 Kyung Hee University, Korea
3161 INVESTIGATION OF WEAR CHARACTERISTICS OF NANO-STRUCTURED SURFACE USING AFM Hyun-Joon Kim1, Dae-Eun Kim2 1 Kyungpook National University, 2 Yonsei University, Korea	3097 EFFECT OF MATING MATERIAL ON THE FRICTION-INDUCED STRUCTURECHANGE OF DLC FILM Eitaro Nakatani1, Hiroyuki Kousaka1, Xingrui Deng1, Noritsugu Umehara1 1 Nagoya University, Japan	3191 STUDY ON CONTACT FORCE EFFECTED BY CURRENT DENSITY DISTRIBUTION, INDUCTANCE GRADIENT BETWEEN RAILGUN AND ARMATURE AS ARMATURE GEOMETRY AND ITS EXPERIMENT Hong-Kyo Kim1, Beom-Soo Kang1, Hak-Gon Noh1, Jeong Kim1 1 Pusan National University, Korea	3116 A PNEUMATICALLY ASSISTED DIELECTRIC ELASTOMER ACTUATOR TO CREATE HYDRAULICALLY-COUPLED SURFACE BULGING Kazuma Takei1, Minsung Cho1, Akio Yamamoto1 1 University of Tokyo, Japan	3229 CASE STUDY: A HYBRID MODEL FOR 3D PRINTED CASTS Huhn Kim1, SeongWon Jeong1 1 Seoul National University of Science and Technology, Korea
3287 COMPARISON OF THE TRIBOLOGICAL PERFORMANCE OF HIP AND SP SINTERED Si3N4-MLG NANOCOMPOSITES Maria Maros B.1, Alexandra K. Né meth1, Zsolt Maros1, Zoltán Károly2, Eszter Bódis2 1 University of Miskolc, 2 Research Centre for Natural Sciences, Hungary	3130 EFFECTS OF TEMPERATURE AND OXYGEN CONCENTRATION OF WATER ON WEAR OF DIAMOND-LIKE CARBON UNDER PRESSURIZED HOT WATER Bin Mohamad Zin Mohd Rody1, Kiichi Okuno1, Noritsugu Umehara1, Naruhiko Inayoshi2, Keiji Sasaki2, Shingo Kawara1, Hiroyuki Kousaka1, Xingrui Deng1 1 Nagoya University, 2 DENSO Corporation, Japan	3232 DEVELOPMENT OF HUMANOID HAND WHICH CAN GRASP A FRAGILE OBJECT Naoki Fukaya1, Shigeki Toyama2 1 Tokyo Metropolitan College of Industrial Technology, 2 Tokyo University of Agriculture and Technology, Japan	3043 POSITIONING ACCURACY AND POSITION KEEPING PERFORMANCE UNDER HEAVY LOAD BY DIFFERENTIAL ROTARY TO LINEAR CONVERSION MECHANISM Masanori Seki1, Ichiro Shimizu1, Masahiro Fujii2 1 Okayama University of Science, 2 Okayama University, Japan	3259 EFFECT OF LAYER THICKNESS ON SURFACE MORPHOLOGY OF INKJET PRINTED SILVER NANOPARTICLES Yoon Jae Moon1, Jun Young Hwang1, Heuseok Kang1, Kyungtae Kang1, Seung Jae Moon2 1 Korea Institute of Industrial Technology, 2 Hanyang University, Korea

	Plenary Room	Room A	Room B	Room C	Room D	Room E
9:00-9:45	INV-2 NEW PNEUMATIC ARTIFICIAL MUSCLE REALIZING GIACOMETTI ROBOTICS AND SOFT ROBOTICS Koichi Suzumori Tokyo Institute of Technology, Japan					
9:45-10:15	KN-3 INNOVATIVE "MONOZUKURI" FOR GLOBAL AUTOMOTIVE TRANSMISSIONS Yoshitomo Suzuki JATCO Ltd., Japan					
10:15-10:30	Break					
10:30-12:00		<b>Transmission (1)</b>	<b>Sustainable Tribology/ Tribology in Manufacturing/ Maintenance Tribology</b>	<b>Cutting (1)</b>	<b>Electrically Driven Actuators</b>	<b>Forming</b>
		3004 INVESTIGATION OF DYNAMIC BEHAVIOR OF PLANET GEAR UNDER THREE AXES DRIVING PLANETARY GEAR SET Masao Nakagawa1, Mohamed Ali Ben Abbes1, Toshiaki Hirogaki1, Eiichi Aoyama1 1 Doshisha University, Japan	3009 DEVELOPMENT OF ADHESION CONTROL METHOD FOR THERMOPLASTIC RESIN WITH AC ELECTRIC FIELD Motoyuki Murashima1, Noritsugu Umehara1, Hiroyuki Kousaka1 1 Nagoya University, Japan	3040 EXAMINATION ABOUT REDUCE SURFACE DEFECT IN ULTRA-PRECISION CUTTING OF Al-Mg ALLOYS Tomohiro Iida1, Yukio Maeda1, Daisuke Hirase1, Hideaki Tanaka1, Kazuya Kato2, Takanori Yazawa3 1 Toyama Prefectural University, 2 Shonan Institute of Technology, 3 Nagasaki University, Japan	3212 TORQUE AND THRUST CONTROL OF A ROTATIONAL/LINEAR 2 DEGEERS OF FREEDOM SWITCHED RELUCTANCE MOTOR Yasukazu Sato1, Yoshiki Kanno1 1 Yokohama National University, Japan	3071 FABRICATION OF AIRCRAFT WINGLET MOLD USING MULTI-POINT DIELESS FORMING TECHNOLOGY Ji-woo Park1, Jeong Kim1, Tae-wan Ku1, Beom-soo Kang1 1 Pusan National University, Korea
		3023 DYNAMIC BEHAVIOR ANALYSIS OF A PAIR OF GROUND SPUR GEAR Shuting Li1, Atsushi Nishimura1 1 Shimane University, Japan	3064 A STUDY ON IDENTIFICATION OF TRIBOLOGICAL PROCESS ON RAKE FACE OF CUTTING TOOL USING ACOUSTIC EMISSION TECHNIQUE Alan Hase1 1 Saitama Institute of Technology	3041 STUDY ON TOOL WEAR CHARACTERISTICS OF NICKEL-BASED SUPER ALLOY CUTTING WITH COOLING SYSTEMS Shinji Yamada1, Yukio Maeda1, Hideaki Tanaka1, Kazuya Kato2, Takanori Yazawa3 1 Toyama Prefectural University, 2 Shonan Institute of Technology, 3 Nagasaki University, Japan	3270 DESIGN AND APPLICATION OF ACTIVE MAGNETIC BEARINGS FOR AN INDUSTRIAL TURBO-COMPRESSOR Myounggyu D. Noh1, Seongki Baek1, Sunggyu Nam1, Young-Woo Park1 1 Chungnam National University, Korea	3108 DESIGN OF APPARATUS FOR FLEXIBLY-RECONFIGURABLE ROLL FORMING PROCESS FOR 3D CURVED SHEET FORMING AND ITS IMPLEMENTATION Jun-Seok Yoon1, Hyeon-Ho Kim1, Jeong Kim1, Beom-Soo Kang1 1 Pusan National University, Korea
		3032 RELATIVE MOTIONAL AND MODAL ANALYSIS OF PLANETARY GEAR TRAIN MESHING USING A TORIONAL DAMPED MODEL BASED ON BOND GRAPH Mohamed Ali Ben Abbes1, Masao Nakagawa1, Toshiaki Hirogaki1, Eiichi Aoyama1 1 Doshisha University, Japan	3101 COLORIMETRIC ANALYSIS FOR THE ESTIMATION OF OXIDATIVE DEGRADATION OF TURBINE OILS Tomohiko Kon1, Tomomi Honda1, Eiki Kitahara1, Akihiko Yano2, Akira Sasaki3 1 University of Fukui, 2 Mitsubishi Heavy Industries Ltd., 3 Maintek Consultant, Japan	3061 A NOVEL DESIGN CONCEPT OF CUTTING TOOLS FOR CFRP COMPOSITES FOCUSING ON DIFFERENCE OF WEAR RATIOS AT RAKE AND FLANK FACES Satoru Maegawa1, Yuta Morikawa1, Shinya Hayakawa1, Fumihiro Itoigawa1, Takashi Nakamura1 1 Nagoya Institute of Technology, Japan	3117 PLANAR 2-DOF ELECTROSTATIC ACTUATOR WITH LAYERED ORTHOGONAL ELECTRODES Ryuta Iguchi1, Akio Yamamoto1 1 The University of Tokyo, Japan	3166 NUMERICAL VERIFICATION ON FORMABILITY OF METALLIC ALLOYS FOR SKIN STRUCTURE USING MULTI-POINT DIELESS FORMING Misganaw Abebe Baye1, Tae-Wan Ku1, Beom-Soo Kang1 1 Pusan National University, Korea
		3042 EVALUATION OF HANDLE ROTATIONAL FEELING IN FISHING REELS USING A BONE CONDUCTION SPEAKER BASED ON TRANSMISSION ERROR OF GEAR PAIRS Tetsuo Inoue1, Syuhei Kurokawa2, Takashi Maeno3, Yasutoshi Makino4 1 Shimano Inc., 2 Kyushu University, 3 Keio University, 4 Tokyo University, Japan	3125 DEVELOPMENT OF DEGRADATION DIAGNOSIS METHOD FOR THE AMINE ANTIOXIDANTS BY THE COLORIMETRIC ANALYSIS OF MEMBRANE PATCHES Daisuke Hamano1, Tomomi Honda1 1 University of Fukui, Japan	3062 APPROACH TO SUPPRESSION OF TOOL WEAR BY EXTREMELY SHORT TIME CUTTING Yuki Terasaka1, Fumihiro Itoigawa1, Satoru Maegawa1, Takashi Nakamura1 1 Nagoya institute of technology, Japan	3147 CONTROL OF XY STAGE USING ULTRASONIC LINEAR MOTOR FOR POSITIONING AND CONTINUOUS MOTION Dong-Jin Lee1, You-Young Kim1, Min-Keon Lee1, Sun-Kyu Lee1 1 Gwangju Institute of Science and Technology, Korea	3188 FORMABILITY ENHANCEMENT EFFECT OF INTERACTION BETWEEN TOOL AND WORKPIECE ON ELECTROMAGNETIC FORMING PROCESS YeonHee Lee1, HongKyo Kim1, WooJin An1, HakGon Noh1, Jeong Kim1 1 Pusan National University, Korea
		3195 EXPERIMENTAL INVESTIGATION OF VIBRATION BEHAVIOR OF A PLANETARY GEAR SYSTEM Shigeki Matsumura1, Haruo Houjoh1 1 Tokyo Institute of Technology, Japan	3129 EFFECT OF SPRAY SLURRY NOZZLE ON COPPER CMP RESULTS Dasol Lee1, Hyunseop Lee2, Hon-Zong Choi3, Haedo Jeong1 1 Pusan National University, 2 Tongmyong University, 3 Korea Institute of Industrial Technology (KITECH), Korea	3063 SHARPENING OF PcbN TOOL EDGE FOR HIGH-PRECISION TURNING WITH SHORT PULSE LASER - IMPROVEMENT OF FINISHED SURFACE QUALITY Shinya Suganuma1, Fumihiro Itoigawa1, Kei-ichi Kawata2, Shinya Hayakawa1, Takashi Nakamura1 1 Nagoya Institute of Technology, 2 Aichi Center for Industry and Science Technology, Japan	3258 SPHERICAL ULTRASONIC MOTOR FOR SPACE Taro Ohashi1, Nishizawa Uichi1, Naoki Fukaya2, Shigeki Toyama1 1 Tokyo University of Agriculture and Technology, 2 Tokyo Metropolitan College of Industrial Technology, Japan	3265 AN INFLUENCE OF GEOMETRIC PARAMETERS ON SURFACE DEFLECTION IN RECTANGULAR EMBOSING Wan-Jin Chung1, Woo-Sung Kim2 1 Seoul National University of Science and Technology, 2 Korea Institute of Industrial Technology, Korea
			3271 ROLE OF SURFACE TOPOGRAPHY ON WETTABILITY AND TRIBOLOGICAL PROPERTIES Harpreet Singh Grewal1, Eui-Sung Yoon1 1 Korea Institute of Science and Technology, Korea	3164 WHEEL PROFILE FOR IRREGULAR FLUTE PROFILE IN HELICAL GROOVING Van-Hien Nguyen1, Byeong-Chan Kwon1, Sung-Lim Ko1 1 Konkuk University, Korea	3088 DEVELOPMENT OF SHAPE MEMORY ALLOY ACTUATOR MOUNTED COOLING MECHANISM FOR EXTERNALLY POWERED PROSTHETIC HAND FOR CHILDREN Atsunori Hashimoto1, Hironari Taniguchi1, Syunsuke Iduhara1 1 National Institute of Technology, Tsuyama College, Japan	
12:00-13:00	Lunch					
13:00-13:30	KN-4 TRIBOLOGY IN WEB HANDLING Hiromu Hashimoto Tokai University, Japan					
13:30-14:30	Poster Session					
14:30-14:45	Break					
14:45-16:15		<b>Transmission(2)</b>	<b>Lubrication</b>	<b>Cutting(2)/ Grinding/ Polishing</b>	<b>Sensing Systems</b>	<b>Design for Manufacturability (DFM)</b>
		3052 DAMAGE DIAGNOSIS OF GEAR TOOTH SURFACE WITH A NEAREST NEIGHBOR METHOD Kosuke Okada1, Kazuteru Nagamura1, Kiyotaka Ikejo1, Mitsuo Hashimoto1, Qingrong Fan1 1 Hiroshima University, Japan	3074 EFFECT OF CONTACT LOAD AND TEMPERATURE ON TRIBOLOGICAL PROPERTIES OF a-C:H UNDER PAO LUBRICATION Xiang Li1, Noritsugu Umehara1, Xingrui Deng1, Hiroyuki Kousaka1 1 Nagoya University, Japan	3252 EXPERIMENTAL STUDY ON MICRO-DRILLING PROCESS OF TITANIUM ALLOY USING NANOFUID MINIMUM QUANTITY LUBRICATION (MQL) Jung Soo Nam1, Sang Won Lee1 1 Sungkyunkwan University, Korea	3152 HIGH ACCURACY ATOMIC FORCE MICROSCOPE WITH SELF-OPTIMIZING SCAN CONTROL Ah-Jin Jo1, Byoung-Woon Ahn1, Sang-Han Chung1, Sang-Han Chung1, Sang-Joon Cho1, Sang-Il Park1 1 Park systems Corp. R&D center, Japan	3133 NUMERICAL PREDICTION OF DYNAMIC LOADS ON 6-DOF MOTION PLATFORM FOR SLOSHING TEST USING CO-SIMULATION BETWEEN MPS AND MFBDD Hee-Sung Shin1, Sung-Pill Kim1, Soo-Hoon Bae1, Jong-Chun Park1 1 Pusan University, Korea
		3070 EFFECTS OF FINISHING PROCESS OF MATING STEEL GEAR ON LOAD CAPACITY OF PLASTIC GEAR Ichiro Moriwaki1, Yuki Nishio1, Morimasa Nakamura1, Daisuke Iba1 1 Kyoto Institute of Technology, Japan	3029 EFFECTS OF THE MECHANICAL PROPERTIES OF THE GREASE THICKENER ON THE NOISE REDUCTION CHARACTERISTICS OF THE BEARING Kanako Takahara1, Kazunori Miyake1, Ryuji Nakata1, Hirokazu Arai1 1 JTEKT Corporation, Japan	3255 ENERGY CONSUMPTION ANALYSIS CONSIDERING THE DYNAMIC VARIATIONS PRODUCED BY THE NC CONTROLLERS FOR AL 6061 AND AL 7075 MILLING Oscar Velásquez A.1, Jae-Hyeok Kim1, Kyung-Hee Park1.2, Seok-Woo Lee1, Dong Yoon Lee1 1 IT Converged Process R&BD Group, 2 Manufacturing System R&BD Group, Korea	3178 LOW COST FABRICATION OF METAL-BASED TRANSPARENT TOUCH SENSORS USING LASER DIRECT PATTERNING METHOD Bongchul Kang1, Junghwan Park2, Seokwoo Son2, Jongeun Park2, Minyang Yang2 1 Kumoh National Institute of Technology (KIT), 2 Korea Advanced Institute of Science and Technology (KAIST), Korea	3214 DESIGN AND DEVELOPMENT OF OFF-LINE PROGRAMMING SYSTEM FOR WELDING ROBOT CELL Pranod Munasinghe1, Nuwan Wickramasinghe1, Than Lin1, Erik L. J. Bohez1, Liu Liang Bo2 1 Asian Institute of Technology, 2 AAPICO Hitech Public Company Limited, Thailand
		3127 EXPERIMENTAL INVESTIGATION OF VACUUMING A GEAR BOX BY THE INTERIOR GEAR PAIR FOR DECREASING WINDAGE LOSS Haruo Houjoh1, Naoki Abiko1, Ryo Koitabashi2, Takeshi Iino1, Shigeki Matsumura1 1 Tokyo Institute of Technology, 2 Mitsubishi Hitachi Power Systems Ltd., Japan	3053 DEVELOPMENT OF THE LOW-OIL SUPPLY JOURNAL BEARING FOR STEAM TURBINE Motoki Sato1, Kenta Suzuki1, Makoto Hemmi1 1 Hitachi, Ltd., Japan	3260 STUDY ON PREVENTION MECHANISM OF CHIP SNARLING FOR TAPPING TOOL COVERED WITH NICKEL-PHOSPHORUS/ABRASIVE PARTICLES COMPOSITE FILM Yasuyoshi Saito1, Yuki Kadota1, Takeshi Yamaguchi1, Kei Shibata1, Takeshi Kubo2, Wataru Watanabe2, Satoru Oyama2, Kazuo Miyakigawa1 1 Tohoku University, 2 MIYAGITANOI MFG. CO., LTD, Japan	3078 DESIGN AND VALIDATION OF NONCONTACT INDUCTIVE PRESSURE SENSOR Myounggyu D. Noh1, Seongki Baek1, Young-Woo Park1 1 Chungnam National University, Korea	3198 LOW VELOCITY IMPACT BEHAVIOR OF FIBER-METAL LAMINATES BASED ON SELF-REINFORCED POLYPROPYLENE Byoung-Eon Lee1, Eu-Tteum Park1, Dong-Sik Kang1, Beom-Soo Kang1, Woo-Jin Song1 1 Pusan National University, Korea
		3136 CHANGES IN CONTACT STRESSES ON A HIGH-SPEED MICROGEAR DUE TO FRICTIONAL HEAT Cheol Kim1, Hyeong-Seok Kim1, Seho Kwak2 1 Kyungpook National University, 2 Saeshin Precision Co., Ltd., Korea	3153 GREASE DECOMPOSITION AND HYDROGEN GENERATION BY CONTACT WITH NASCENT STEEL SURFACE Toshiaki Wakabayashi1, Yasuha Tokumo2, Kiyomi Sakamoto2, Yuji Shitara2 1 Kagawa University, 2 JX Nippon Oil & Energy Corporation, Japan	3039 GRINDING OF MICRO-GROOVES IN CEMENTED CARBIDE DIES USING ELECTROPLATED DIAMOND GRINDING WHEEL Daisuke Goto1, Yukio Maeda1, Kenichi Iwatsuka1, Norifumi Imai1, Hideaki Tanaka1, Kazuya Kato2, Takanori Yazawa3 1 Toyama Prefectural University, 2 Shonan Institute of Technology, 3 Nagasaki University, Japan	3263 ACTIVE AIRFLOW GENERATION IN GAS SENSING SYSTEM TO ENHANCE ITS DIRECTIVITY Haruka Matsukura1, Takafumi Kusunoki1, Yuki Arai1, Hiroshi Ishida1 1 Tokyo University of Agriculture and Technology, Japan	3194 TEMPERATURE-DEPENDENT FLOW STRESS MODELING OF AL ALLOY-SRPP LAMINATED MATERIAL Eu-Tteum Park1, Byoung-Eon Lee1, Dong-Sik Kang1, Jeong Kim1, Beom-Soo Kang1, Woo-Jin Song1 1 Pusan National University, Korea
		3176 INFLUENCE OF PRESSURE ANGLE ON LOAD CARRYING CAPACITY OF CROSSED HELICA GEARS Ryozo Nemoto1, Ema Tamura1, Natsuhiko Seyama1, Eiichirou Tanaka2 1 Tokyo Metropolitan College of Industrial Technology, 2 Saitama University, Japan	3222 STRUCTURE AND SHEAR PROPERTIES OF BOUNDARY LAYERS FOR FRICTION REDUCTION Tomoko Hirayama1,2, Ryota Kawamura1, Koichi Saeki1, Kazuki Yamada1, Yusuke Hashimoto1, Naoki Yamashita1, Shota Akimoto1, Takashi Matsuoka1 1 Doshisha University, 2 JST Presto, Japan	3177 SUCTION DEBURRING FOR INTERSECTION HOLES Byeong-chan Kwon1, Sung Lim Ko1 1 Konkuk University, Korea	3251 MAXIMUM ANGLE INDUCED BY KINESTHETIC ILLUSION UNDER DIFFERENT ACCELERATIONS OF SINUSOIDAL VIBROSTIMULATION Koichi Akahori1, Masakazu Honda2, Tetsu Miyaoka3, Masahiro Ohka1 1 Nagoya University, 2 Industrial Research Institute of Shizuoka Prefecture, 3 Shizuoka Institute of Science and Technology, Japan	
				3223 COMPARISON OF NON-UNIFORMITY ACCORDING TO WAFER PRESSURIZING METHOD IN CHEMICAL MECHANICAL POLISHING Eunjeong Park1, Changsuk Lee1, Jaehong Park2, Honzong Choi3, Haedo Jeong1 1 Pusan National University, Korea, 2 Nitta Haas Incorporated, Japan, 3 Korea Institute of Industrial Technology (KITECH), Korea	3253 DETERMINATION OF THE WRIST TENDON MOST CONDUCTIVE TO A VIVID KINESTHETIC ILLUSION Yuki Kato1, Masakazu Honda2, Tetsu Miyaoka3, Masahiro Ohka1 1 Nagoya University, 2 Industrial Research Institute of Shizuoka Prefecture, 3 Shizuoka Institute of Science and Technology, Japan	