Conference Program

August 8, Monday

9:00-9:30 Main Hall
Opening Ceremony

9:30-10:30 Main Hall
Keynote Lecture-I
Chair: Yoshiaki Terumichi (Sophia University)

Model Order Reduction of Large-Scale Finite Element Models for the Use in Elastic Multibody Systems
Peter Eberhard (together with Thomas Volzer, Philip Holzwarth)

11:00-12:20 Room I
Contact and Impact Problems-1
Chair: Jochen Damerau (Bosch Corp.)

Reducing Friction by Out-Plane Vibration
Zhen Zhao (Beihang University, China), Jian Dong Lu (Beihang University), Qi Wang (Beihang University)

Effect of Normal Contact Force Modelling in Dynamics of Bladed Disks
Michal Hajžman (University of West Bohemia, Czech Republic), Drahomir Rychecky (University of West Bohemia), Jan Bruha (University of West Bohemia)

Multiple Impact Dynamics for Low-Shock Separation Device in Launch Vehicles
Tao Chen (Beihang University, China), Zhen Zhao (Beihang University), Qi Wang (Beihang University), Qingyun Wang (Beihang University)

Continuous Force Approach for Frictional Impact Dynamics of Flexible Multi-link Manipulator Arms
Zhenjie Qian (Nanjing University of Science and Technology, China), Dingguo Zhang (Nanjing University of Science and Technology)

11:00-12:20 Room II
Railroad Systems Dynamics-1
Chair: Hai-dong Yu (Shanghai Jiao Tong University)

A Study to Improve the Active Steering System of Railway Vehicles by Applying Axle Rubber Springs on the Curved Track
Chulhyung Lee (University of AJOU, Republic of Korea), Taewon Park (University of AJOU), Inkyeong Hwang (University of AJOU)

Study on Modeling and Numerical Procedure for Prediction of Wheel Wear Development
Ariku Yoshioka (Graduate School of Sophia University, Japan), Masahiro Tsujie (Railway Technical Research Institute), Jun Matsui (SIMPACK Japan K.K.), Yoshiaki Terumichi (Sophia University)

Profile Wear Prediction Using Multi-Hertzian Contact Approach and Experimental Validation
Christofer Feldmeier (University of Iowa, United States of America), Huaxia Li (University of Iowa), Yosuke Yamazaki (Nippon Steel & Sumitomo Metal), Takanori Kato (Nippon Steel & Sumitomo Metal), Takahiro Fujimoto (Nippon Steel & Sumitomo Metal), Osamu Kondo (Nippon Steel & Sumitomo Metal), Hiroyuki Sugiyama (University of Iowa)

11:00-12:20 Room III
Robotic Systems-1
Chair: Koichi Koganezawa (Tokai University)

Evolution of the Exoskeleton
Sachin Kansal (Indian Institute of Technology Delhi, India), Bhivraj Suthar (Indian Institute of Technology Delhi), Mohd.Zubair (Indian Institute of Technology Delhi), Sudipto Mukherjee (Indian Institute of Technology Delhi)

Jitter Removal in KUKA KR-5 Using Modified Kalman Filter While Tele-Operating with Exoskeleton
Sachin Kansal (Indian Institute of Technology Delhi, India), Sakshi Rawal (Indian Institute of Technology Delhi), Bhivraj Suthar (Indian Institute of Technology Delhi), Mohd.Zubair (Indian Institute of Technology Delhi), Sudipto Mukherjee (Indian Institute of Technology Delhi)

A Novel Human-Like Foot Structure with Toes for Biped Robot
Tinh Nguyen Van (Shibaura Institute of Technology, Japan), Hiroshi Hasegawa (Shibaura Institute of Technology)

Passive Balancing of a Novel Orientation Sensing Mechanism
Shasa A Antao (Amrita Vishwa Vidyapeetham University, India), Vishal S (Amrita Vishwa Vidyapeetham University), Varun V. Nair (Amrita Vishwa Vidyapeetham University), Sangeeth Rajan (Amrita Vishwa Vidyapeetham University), Rajeevlochana G. Chittwadigi (Amrita Vishwa Vidyapeetham University)

11:00-12:20 Room IV
Algorithms, Integration Codes and Software-1
Chair: Juhwan Choi (FunctionBay Inc.)

On Track Anomaly Condition Monitoring System for Railway Vehicles Using Prediction by Big Data Analytics of Running Records
Thagoon Chonpitakpong (The University of Tokyo, Japan) Masaya Sakamoto (The University of Tokyo), Shih-Pin Lin (The University of Tokyo), Yoshihiro Suda (The University of Tokyo), Kenta Yano (Tokyo Metro Co., Ltd.), Takuya Saito (Tokyo Metro Co., Ltd.), Atsushi Iwamoto (Tokyo Metro Co., Ltd.), Yoshinori Hagio (Nippon Steel and Sumitomo Metal Corporation), Masuhisa Tanimoto (Nippon Steel and Sumikin Railways Technology Co., Ltd.)

Mobile FMI Co-Simulation Environment with Smart Connections
Mikio Nagasawa (Cybernet Systems Co., Ltd., Japan), Masaya Sakamoto (The University of Tokyo), Shih-Pin Lin (The University of Tokyo), Yoshihiro Suda (The University of Tokyo), Kenta Yano (Tokyo Metro Co., Ltd.), Takuya Saito (Tokyo Metro Co., Ltd.), Atsushi Iwamoto (Tokyo Metro Co., Ltd.), Yoshinori Hagio (Nippon Steel and Sumitomo Metal Corporation), Masuhisa Tanimoto (Nippon Steel and Sumikin Railways Technology Co., Ltd.)

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Numerical Correction of the Mathematical Constraint When Using Euler Parameters as Orientation Description in Multibody Systems
Karin Nachbagauer (University of Applied Sciences Upper Austria, Austria), Karim Sherif (University of Applied Sciences Upper Austria), Wolfgang Steiner (University of Applied Sciences Upper Austria)

Isogeometric Analysis of Geometrically Nonlinear Kirchhoff–Love Shell in Multibody Dynamics
Hanjiang Chang (Beijing Institute of Technology, China), Cheng Liu (Beijing Institute of Technology), Qiang Tian (Beijing Institute of Technology), and Haiyan Hu (Beijing Institute of Technology)

13:20-15:00 Room I
Flexible Multibody Systems-1
Chair: Hiroyuki Sugiyama (University of Iowa)

Kinematic Stability of Variable Cross-Section Beam with Large Deformation by Using Absolute Nodal Coordinate Formulation
Haidong Yu (Shanghai Jiao Tong University, China), Jingjing Luo (Shanghai Jiao Tong University), Chunzhang Zhao (Shanghai Jiao Tong University), Hao Wang (Shanghai Jiao Tong University)

Wear Behavior Analysis Using the Multi-Mass Tire Model
Yu Koketsu (Sophia University, Japan), Shoichiro Takehara (Sophia University), Yoshiaki Terumichi (Sophia University), Zenichiro Shida (The Yokohama Rubber Co., Ltd.), Toshiyuki Ikeda (The Yokohama Rubber Co., Ltd.)

Modeling and Attitude Control of the Mobility Device Using Tether in Microgravity Environment
Wataru Miyaji (Sophia University, Japan), Shoichiro Takehara (Sophia University), Yu Uematsu (Sophia University)

13:20-15:00 Room II
Railroad Systems Dynamics-2
Chair: Hiroaki Ishida (Meisei University)

Modeling Method of Bogie Rotational Resistance for Numerical Simulation
Takayuki Tanaka (Railway Technical Research Institute, Japan), Takefumi Miyamoto (Railway Technical Research Institute), Kohei Iida (Railway Technical Research Institute)

Using Full-Scale Experimnets to Verify a Full-Vehicles Dynamics Simulation
Satoshi Hara (Central Japan Railway Company, Japan), Kazuhiko Nishimura (Central Japan Railway Company)

Modeling and Running Performance Analysis of EEF Bogie with Inclined Wheel-Axles
Ryosuke Shiga (Ibaraki University, Japan), Yohei Michitsuji (Ibaraki University), Yoshihiro Suda (The University of Tokyo), Kenji Ejiri (The University of Tokyo), Shingo Makishima (Toyo Denki Seizo K.K.)

Fundamental Study on Generating of Rail Corrugation Using Vehicle / Track Multibody Dynamics Simulation Considered Track Stiffness
Mitsuru Hosoda (Railway Technical Research Institute, Japan), Hirofumi Tanaka (Railway Technical Research Institute), Yuki Nishinomiya (Railway Technical Research Institute)

13:20-15:00 Room III
Robotic Systems-2
Chair: Terumasa Narukawa (Saitama University)

Mechanical Stiffness Control of a Three DOF Wrist Joint That Mimics the Musculoskeletal System
Sho Makino (Tokai University, Japan), Koich Koganezawa (Tokai University)

Tele-Operation of KUKA KR5 by an Arm Exoskeleton through Immersive Environment for Peg-In-Hole Operation
Sachin Kansal (Indian Institute of Technology Delhi, India), Nishant Bugalia (Indian Institute of Technology Delhi), Bhivraj Suthar (Indian Institute of Technology Delhi), Mohd.Zubair (Indian Institute of Technology Delhi), Sudipto Mukherjee (Indian Institute of Technology Delhi)

Five Finger Robot Hand with a Planetary Gear System
Yutaro Sato (Tokai University, Japan), Koichi Koganezawa (Tokai University)

The Artificial Finger Using the Double Planetary Gear System
Kazuya Takeda (Toka University, Japan), Hideki Chiba (Tokai University), Koichi Koganezawa (Tokai University)

13:20-15:00 Room IV
Algorithms, Integration Codes and Software-2
Chair: Etsujiro Imanishi (Kobe Steel Ltd.)

Kinematic Analysis of Mechanisms Using Velocity and Acceleration Diagram (VAD) Module in MechAnalyzer Software
Sachin Kumar Verma (National Institute of Technology Karnataka, India), Rohit Kumar (National Institute of Technology Karnataka), Rajeevlochana Gopalakrishna Chittawadigi (Amrita Vishwa Vidyapeetham University, Bengaluru), Subir Kumar Saha (Indian Institute of Technology Delhi)

An Efficient Contact Modeling and Simulation for the Ball Screw Multi-Body System Using a New Geo Sphere Contact in RecurDyn
Inho Song (FunctionBay, Inc., Republic of Korea), Seongsu Kim (FunctionBay, Inc.), Juhwan Choi (FunctionBay, Inc.), Jin Hwan Choi (Kyunghee University)

A Development of Converting Shell Element to High Order Solid Element for Thin Plate
Daesung Bae (Hanyang University, Republic of Korea), Kwang Ok Jung (Hanyang University), Huije Cho (Virtual Motion inc), Chulho Lee (Virtual Motion inc)

An Improvement of the Generalized Geometry Contact Algorithm for Modal Reduction Flexible Bodies
Ho-Young Cha (FunctionBay, Inc., Republic of Korea), Juhwan Choi (FunctionBay, Inc.), Sungsoo Rhim (Kyunghee University), Jin Hwan Choi (Kyunghee University)

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15:20-17:00 Room I
Flexible Multibody Systems-2
Chair: Wan Suk Yoo (Pusan National University)

Study on Curve Veering in the Dynamics of Rotating Blades
Liang Li (Nanjing University of Science and Technology, China), Dingguo Zhang (Nanjing University of Science and Technology)

Steady State and Free Vibration Analysis of a 3D Rotating Euler Beam with Arbitrary Setting Angle
Chu Chang Huang (National Chiao Tung University, Taiwan), Wen Yi Lin (De Lin Institute of Technology), Kuo Mo Hsiao (National Chiao Tung University)

Development of a Calculation Procedure for the ANCF Shear Deformable Beam Element Using Local Coordinate Systems
Tatsuhito Fukuda (Tokyo Institute of Technology, Japan), Hiroki Kamiya (Tokyo Institute of Technology), Kensuke Hara (Tokyo Institute of Technology)

Folding and Unfolding Properties of Extension Boom with Slide Fasteners for High Rigidity and Storability
Sota Suzuki (Tokyo Institute of Technology, Japan), Saburo Matunaga (Tokyo Institute of technology), Hiroshi Furuya (Tokyo Institute of technology), Yasuyuki Miyazaki (Nihon University), Akito Watanabe (Sakase Adtech Co. Ltd.)

15:20-17:00 Room II
Railroad Systems Dynamics-3
Chair: Yoshiaki Terumichi (Sophia University)

Three-Dimensional Flexural Vibration Model for Railway Vehicle Carbodies by Using Multi Body System
Yuki Akiyama (Railway Technical Research Institute, Japan), Takahiro Tomioka (Railway Technical Research Institute), Shogo Kamoshita (Railway Technical Research Institute), Ken-ichiro Aida (Railway Technical Research Institute)

Study on the Suitability of Independently Rotating Wheels with Negative Tread Conicity for the Present Railway Track
Daiki Tamura (The University of Tokyo, Japan), Kenji Ejiri (The University of Tokyo), Masaya Sakamoto (The University of Tokyo), Shihpin Lin (The University of Tokyo), Yohei Michitsuji (Ibaraki University), Yoshihiro Suda (The University of Tokyo)

A Study of Dynamic Analysis of a Next-Generation Ultra-High-Speed Train with Independent Wheel Using the Scaled Rig Model of MMU
In-kyeong Hwang (Ajou University, Republic of Korea), Tae-won Park (Ajou university), Myeong-jun Kim (Ajou university), Nam-po Kim (Korea Railroad Reserch Institute)

15:20-17:00 Room III
Robotic Systems-3
Chair: Subir K. Saha (IIT Delhi)

Dynamics and Control of Two-Mobile Modules of Climbing Robot Connected by a Manipulator
Ravindra S. Bisht (IIT Roorkee, India), Pushparaj M. Pathak (IIT Roorkee), Saroj K. Panigrahi (CSIR-Central Building Research Institute Roorkee)

Dexterous Envelope Grasping of Multi-Joint Gripper with Variable Stiffness Mechanism
Takumi Tamamoto (Tokai University, Japan), Kazuhiro Sayama (Tokai University), Koichi Koganezawa (Tokai University)

Optimal Control of an Active Bumper with a Series Elastic Actuator for Crash Safety of Small Unmanned Vehicles
Terumasa Narukawa (Saitama University, Japan), Tomoki Tsuge (Saitama University), Hiroshi Yamamoto (Saitama University), Takahiro Suzuki (Saitama University)

Motion Planning of Multi Body Robots Using Feedback Control Simulation Under Multiple Physical Constrains
Tempei Wachi (Tokyo University of Agriculture and Technolgy, Japan), Yasutaka Tagawa (Tokyo University of Agriculture and Technolgy)

15:20-17:00 Room IV
Control and Mechatronics
Chair: Hao Wang (Shanghai Jiao Tong University)

An Controller Design Procedure for 2-Flexible Link Manipulator by the Use of ANCF Model
Yoshiki Sugawara (Akita University, Japan), Nagayuki Kudou (Akita University)

Simulation Study on an Acceleration Control System for Semi-Active In-Car Crib with Joint Application of Regular and Inverted Pendulum Mechanisms
Takeshi Kawashima (Kanagawa Institute of Technology, Japan)

An Approach for Vision Based Manipulation
Sachin Kansal (Indian Institute of Technology Delhi, India), Sudipto Mukherjee (Indian Institute of Technology Delhi)

Quasi-Static Deployment and Retraction Using Electromagnetic Force in Satellite Missions
Masashi Tomooka (The University of Tokyo, Japan), Takaya Inamori (The University of Tokyo), Yoshiki Sugawara (Akita University), Yasutaka Satou (Tokyo Institute of Technology), Ryu Funase (The University of Tokyo), Shin-ichi Nakasuka (The University of Tokyo)

Attitude Control System of a Space Membrane Using Electromagnetic Torque
Takaya Inamori (The University of Tokyo, Japan), Tsubasa Kawai (The University of Tokyo), Yoshiki Sugawara (Akita University), Yasutaka Satou (Tokyo Institute of Technology)

Conference Program

August 9, Tuesday

9:00-10:20 Room I
Contact and Impact Problems-2
Chair: Jin Hwan Choi (Kyunghee University)

Oblique Impact Dynamic Modeling for Flexible Multibody Systems Based on Contact Constraint
Yue Chen Duan (Zhengzhou University, China), Ding Guo Zhang (Nanjing University of Science and Technology)

Evaluation of the Coefficient of Restitution Matrix in Multiple Impacts of Three Identical Spheres
Hirofumi Minamoto (Shizuoka Institute of Science and Technology, Japan), Robert Seifried (Hamburg University of Technology), Peter Eberhard (Shizuoka Institute of Science and Technology / University of Stuttgart), Shozo Kawamura (Toyohashi University of Technology)

Combination of Component Mode Synthesis Method and Penalty Method for Contact-Impact of Flexible Multi-Body System
Peng Chen (Shanghai Jiao Tong University, China), Jinyang Liu (Shanghai Jiao Tong University)

9:00-10:20 Room II
Multibody Applications and Other Topics-1
Chair: Ding-guo Zhang (Nanjing University of Science and Technology)

Modeling and Analysis of ElastoHydroDynamic lubrication Aritficial Hip Joint via Elements of Absolute Nodal Coordinate Formulation
Jie Lou (School of Aerospace Engineering Beijing Institute of Technology, China), ZhongWei Lv (School of Aerospace Engineering Beijing Institute of Technology), Qiang Tian (School of Aerospace Engineering Beijing Institute of Technology)

A Study on Numerical Analysis for Launching Operation of Deep-Seabed Integrated Mining System
Chang-Ho Lee (Korea Research Institute of Ships & Ocean Engineering (KRISO), Republic of Korea), Jae-Won Oh (KRISO), Su-Gil Cho (KRISO), Cheon-Hong Min (KRISO), Hyung-Woo Kim (KRISO), Sup Hong (KRISO)

Improvement of Interpretation Speed in the Remote Controlled Track-Type Robot
Tae-Yun Kim (Pusan National University, Republic of Korea), Samuel Jung (Pusan National University), Wan-Suk Yoo (Pusan National University)

9:00-10:20 Room III
Biomechanics-1
Chair: Lu-lu Gong (Tongji University)

Computational Analysis for Energy Consumption Rate of Hip Disarticulation Prosthetic Walking
Hisashi Naito (Institute of Science and Engineering, Kanazawa University, Japan), Kazunori Hase (Tokyo Metropolitan University), Masao Tanaka (Osaka University)

Construction of a Simulation Model for Swimming with Diving Fins
Motomu Nakashima (Tokyo Institute of Technology, Japan), Yosuke Tanno (Tokyo Institute of Technology), Takashi Fujimoto (Tabata Corporation), Yutaka Masutani (Tabata Corporation)

Estimation of Human Motion Using Simplified Trunk Model
Ttasuo Unno (Sophia University, Japan), Shoichiro Takehara (Sophia University), Fumiya Takahashi (Sophia University), Kazunori Hase (Tokyo Metropolitan University)

Using Artificial Neural Network to Predict Ground Reaction Forces of Elderly Subjects during Activities of Daily Living
Jochen Damerau (Robert Bosch Corporation, Japan), Jovana Jovic (Robert Bosch Corporation)

9:00-10:20 Room IV
Vehicle Dynamics and Control including Tire Dynamics-1
Chair: Masaki Takahashi (Keio University)

The Shape Optimum Design Using Dynamic Characteristic Analysis Model of Brake Pads
Myeong-Jae Han (University of AJOU, Republic of Korea), Tae-Won Park (University of AJOU), Myeong-Jun Kim (University of AJOU)

An Efficient Tire Model for Three-Dimensional Road in Vehicle Dynamic Analysis
Huxiang Shi (Hanyang University / Virtual Motion, Inc., Republic of Korea), Huije Cho (Virtual Motion, Inc.), Changwook Lee (Virtual Motion, Inc.), Heunghyeok Yim (Virtual Motion, Inc.), Daesung Bae (Hanyang University)

Dynamic Simulation of Visco-Elastic Tire Model Using Absolute Nodal Coordinate Formulation and Fractional Derivative Methods
Zuqing Yu (Harbin Institute of Technology, China), Peng Lan (Harbin Institute of Technology), Nianli Lu (Harbin Institute of Technology)

Multibody Dynamics Analysis of a Tilting Narrow Track Vehicle with Passive Front Wheel Steering
Jeffrey Too Chuan Tan (The University of Tokyo, Japan), Hiroki Arakawa (The University of Tokyo), Yoshihiro Suda (The University of Tokyo)

10:40-12:00 Room I
Contact and Impact Problems-3
Chair: Minamoto Hirofumi (Shizuoka Institute of Science and Technology)

A Study on the Variable Stiffness Method Using Penetration Limitation in a Gear Contact
Sunggyu Cho (FunctionBay, Inc., Republic of Korea), Juhwan Choi (FunctionBay, Inc.), Young Ha Kwon (Kyunghee University), Jin Hwan Choi (Kyunghee University)

Robotic Manipulator Control for Catching a Thrown Object
Naoki Uchiyama (Toyohashi University of Technology, Japan), Yuta Suzuki (Toyohashi University of Technology), Itsuki Shinmura (Toyohashi University of Technology), Shigenori Sano (Toyohashi University of Technology)

Conference Program

Computational Investigation on Modeling of Contact Force
Jianyao Wang (Shanghai Jiao Tong University, China), Zhuyong Liu (Shanghai Jiao Tong University), Jiazhen Hong (Shanghai Jiao Tong University)

Simulating Large Scale Coupled Granular Material Simulations using Position Based Dynamics
Hammad Mazhar (University of Wisconsin, United States of America), Mihai Francu (University of Wisconsin), Dan Negrut (University of Wisconsin)

10:40-12:00 Room II
Multibody Applications and Other Topics-2
Chair: Jeong Hyun Sohn (Pukyong National University)

Performance Evaluation of Cutting Head Attachment by Several Working Postures through Multibody Dynamic Analysis
Jiheon Kang (Pusan National University, Republic of Korea), Jinseok Jang (Pusan National University), Jaewook Lee (Korea Institute of Industrial Technology), Kunwoo Kim (Korea Institute of Industrial Technology), Sangkon Lee (Korea Institute of Industrial Technology), Wansuk Yoo (Pusan National University)

Mechanical-Optical Simulation Based on Flexible Multibody Systems
Johannes Storkle (University of Stuttgart, Germany), Peter Eberhard (University of Stuttgart)

Influences of Stablizers on Controlling the Inclination of Wellpath Based on Multibody Dynamics Approach
Jiapeng Liu (Tsinghua University, China), Zaibin Cheng (CNOOC Research Center), Shiquan Jiang (CNOOC Research Center), Jianliang Zhou (CNOOC Research Center), Jianqiao Guo (Tsinghua University), Yingjie Lu (Tsinghua University), Gexue Ren (Tsinghua University)

A Comparative Study of Multibody Methods Based on the Sparse Technique for the Real-time Simulation of Working Mobile Vehicles
Marko K. Matikainen (Universiti Malaysia Perlis, Malaysia), Ezral Baharudin (Lappeenranta University of Technology, Finland), Pasi Korkealaakso (Mevea Ltd., Finland), Asko Rouvinen (Mevea Ltd.), Aki Mikkola (Lappeenranta University of Technology)

10:40-12:00 Room III
Biomechanics-2
Chair: Motomu Nakashima (Tokyo Institute of Technology)

Predictive Simulation of Reaching to Moving Targets Using Nonlinear Model Predictive Control
Naser Mehrabi (University of Waterloo, Canada), John McPhee (University of Waterloo)

Dynamically Balanced Optimal Gaits for the Biped Walking on Sloping Surfaces
Lulu Gong (Tongji University, China)

Simultaneous Optimization of Long Jump Technique and Sports Prosthesis
Kazunori Hase (Tokyo Metropolitan University, Japan), Shiori Murata (Tokyo Metropolitan University), Goro Obinata (Chubu University)

10:40-12:00 Room IV
Vehicle Dynamics and Control including Tire Dynamics-2
Chair: Takeshi Kawashima (Kanagawa Institute of Technology)

Simulation of Motion of a Multifunctional Off-Road Vehicle (MORV) with Hydrostatic Transmission in Off-Road Conditions: a Mathematical Control Model
Lev V. Barahtanov (Nizhny Novgorod State Technical University, Russian Federation), Sergey E. Manyanin (Nizhny Novgorod State Technical University), Sergey L. Tropin (Nizhny Novgorod State Technical University), Natalia P. Sherstneva (Nizhny Novgorod State Technical University)

Energy Regeneration Performance Test for Electric Two-Wheeled Vehicle
Dae Gyu Kim (Kangwon National University / Korean Automotive Technology Institute, Republic of Korea), Donguk Kim (Kangwon National University), Seungmo Choi (Kangwon National University), Jisu Kim (Kangwon National University), Shengpeng Zhang (Kangwon National University), Sungchae Park (Kangwon National University), Taeoh Tak (Kangwon National University), Waegyeong Shin (Korean Automotive Technology Institute), Changsu Han (Korean Automotive Technology Institute)

Basic Study on the Movement of an Inverted Pendulum Vehicle and a Four-Wheel Vehicle
Fumihiko Taniguchi (Osaka Prefecture University, Japan), Chihiro Nakagawa (Osaka Prefecture University), Atsuhiko Shintani (Osaka Prefecture University), Tomohiro Ito (Osaka Prefecture University)

13:00-14:20 Room I
Flexible Multibody Systems-3
Chair: Nobuyuki Shimizu (Motion Lab Inc.)

Using Feedthrough to Avoid Unphysical Frequencies in Reduced Systems
Pascal Ziegler (University of Stuttgart, Germany), Michael Baumann (University of Stuttgart), Philip Holzwarth (University of Stuttgart), Nico Walz (University of Stuttgart), Peter Eberhard (University of Stuttgart)

Level Set Based Topology Optimization of a Flexible Multibody Dynamic System Described by ANCF
Jialiang Sun (Nanjing University of Aeronautics and Astronautics, China), Qiang Tian (Beijing Institute of Technology), Haiyan Hu (Nanjing University of Aeronautics and Astronautics / Beijing Institute of Technology)

Effect of Inertia for Shaft Movement Generated by a Golf Swing
Kenta Matsumoto (Doshisha University, Japan), Nobutaka Tsujiuchi (Doshisha University), Akihito Ito (Doshisha University), Masahiko Ueda (Sumitomo Rubber Industries, Ltd), Kosuke Okazaki (Sumitomo Rubber Industries, Ltd), Taiki Seita (Doshisha University)

13:00-14:20 Room II
Multibody Applications and Other Topics-3
Chair: Tsuyoshi Inoue (Nagoya University)

A Study on Various Contacting Soil Ground with Tracked Mining Robot for Deep-Seabed
Jun Hyun Lim (Hanyang University, Republic of Korea), Dae Sung Bae (Hanyang University), Jae Won Oh (Hanyang University / Technology Center for Offshore Plant Industries), Hyung Woo Kim (Technology Center for Offshore Plant Industries), Sub Hong (Technology Center for Offshore Plant Industries), Hui Je Cho (Virtual Motion, Inc.), Ki Rang Kang (Virtual Motion, Inc.)

Conference Program

Determination of Deformation Limit of Assembly Fuel Guide Tubes of the VVER 1000 Nuclear Reactor
Pavel Polach (Research and Testing Institute Plzeň, Czech Republic), Michal Hajžman (Research and Testing Institute Plzeň), Radek Bulín (University of West Bohemia)

Dynamic Characteristics of Moment Stiffness of Hub Bearing
Naoto Shibutani (NTN corporation, Japan), Daisuke Imada (NTN corporation), Tomoya Sakaguchi (NTN corporation)

Research on the Coupling Vibrations Between Powertrain and Drive Axle for Front-Engine Rear-Drive Vehicle
Tongli Lu (Shanghai Jiao Tong University, China), Jiamin Lu (Shanghai Jiao Tong University), Guanghui Liu (Shanghai Jiao Tong University), Xiqiang Guan (Shanghai Jiao Tong University), Jianwu Zhang (Shanghai Jiao Tong University)

13:00-14:20 Room III
Multiphysics in Multibody Systems-1
Chair: Jin-yang Liu (Shanghai Jiao Tong University)

Analysis of Internal Flow of the Self Inflating Tire and the Optimal Shape Design of the Tube
Myeongjun KIM (University, of Ajou Republic of Korea), Taewon Park (University, of Ajou), Inkyeong Hwang (University, of Ajou), Myeongjae Han (University, of Ajou)

'S' Shaped Broadband Piezoelectric Energy Harvester
Sin Woo Jeong (Hanyang University, Republic of Korea), Hong Hee Yoo (Hanyang University)

Dynamic Simulation and Correlation of a Washing Machine Hydro Balancer Using MBD and Particle Based Fluid Analysis Method
Jeonghan Lee (FunctionBay. Co. Ltd., Republic of Korea), Jin-soo Kim (FunctionBay. Co. Ltd.), Jin-hong Park (LG Electronics), Man-su Park (LG Electronics), Gab-sik Jung (LG Electronics), Jin-hwan Choi (Kyunghee University)

13:00-14:20 Room IV
Vehicle Dynamics and Control including Tire Dynamics-3
Chair: Yohei Michitsuji (Ibaraki University)

Handling Performance of a Vehicle According to Tire Pressure Change
Jong Min Kim (Pusan National University, Republic of Korea), Sang-Do Na (Pusan National University), Wan-Suk Yoo (Pusan National University)

Quasi-Static Equilibrium Analysis for Predictive Control of Vehicle Maneuvering
Samuel Jung (Pusan National University, Republic of Korea), Tae-Yun Kim (Pusan National University), Wan-Suk Yoo (Pusan National University)

Physics-Based Deformable Tire Model for On / Off-Road Vehicle Dynamics Simulation
Hiroki Yamashita (University of Iowa, United States of America), Paramsothy Jayakumar (US Army TARDEC), Hiroyuki Sugiyama (University of Iowa)

14:40-16:00 Room I
Flexible Multibody Systems-4
Chair: Peter Eberhard (University of Stuttgart)

Numerical Approach for Flexible Body Motion with Large Deformation, Displacement and Time-Varying Length
Masayuki Fujiwara (Sophia University, Japan), Shoichiro Takehara (Sophia University), Yoshiaki Terumichi (Sophia University)

Report on Microgravity Experiments of Self-Deployable Truss Structure Consisting of BCON Booms
Akihiro Tamura (Nihon University, Japan), Shota Inoue (Nihon University), Daishi Kawarabayashi (Nihon University), Dan Hyodo (Nihon University), Yasuyuki Miyazaki (Nihon University),

Finite Element Method for Nonlinear Dynamics of Inclined Cable with Support Motion
Kun Wang (University of Macau, China), Guo-Kang Er (University of Macau), Vai Pan Iu (University of Macau)

14:40-16:00 Room II
Multibody Applications and Other Topics-4
Chair: Yoshiki Sugawara (Aoyama Gakuin University)

Proper Design of Hydraulic Cylinder Using Multibody Dynamics Simulation and Commerial Product Database
Jaewon Oh (KRISO / Hanyang University, Republic of Korea), Hyungwoo Kim (KRISO), Daesung Bae (Hanyang University), Cheonhong Min (KRISO), Sugil Cho (KRISO), Changho Lee (KRISO), Sanghyun Park (KRISO / Hanyang University)

Dynamic Behaviors of Rotating Functionally Graded Timoshenko Beams Using Chebyshev-Ritz Method
Jianshi Fang (Nanjing Institute of Technology, China), Ding Zhou (Nanjing Tech University), Dingguo Zhang (Nanjing University of Science and Technology)

Capturing Dynamics of Flexible Ropes on Space Large-Scale End Effector
Pengfei Xin (Beijing Institute of Technology, China), Jili Rong (Beijing Institute of Technology), Xun Zhuge (Beijing Institute of Technology / Beijing Aerospace Propulsion Institute), Yongtai Yang (Chinese Academy of Sciences), Dalin Xiang (Beijing Institute of Technology)

14:40-16:00 Room III
Multiphysics in Multibody Systems-2
Chair: Tsuyoshi Inoue (Nagoya University)

Energy Absorption Efficiency Analysis of the Wave Power Generation System by Using Multibody Dynamics
Min-Soo Kim (Pukyong National University, Republic of Korea), Jeong-Hyun Sohn (Pukyong National University), Yong-June Sung (INGINE), Jung-Hee Kim (INGINE)

Efficient Modeling of DVI-Based Frictional Contact for Flexible ANCF Tires on Deformable Terrain using the GPU
Daniel Melanz (University of Wisconsin, United States of America), Dan Negrut (University of Wisconsin)

Conference Program

Two Approaches To Simulating Large Multi-Scale Dynamics Problems Involving Soil Mechanics
Hammad Mazhar (University of Wisconsin, United States of America), Mridul Aanjaneya (University of Wisconsin), Dan Negrut(University of Wisconsin)

14:40-16:00 Room IV
Vehicle Dynamics and Control including Tire Dynamics-4
Chair: Chihiro Nakagawa (Osaka Prefecture University)

Influence of Frame Stiffness on Handling Stability in Solar Vehicle
Hiroaki Hoshino (Altair Engineering Ltd., Japan), Shota Uchiyama (Kanazawa Institute of Technology), Masahiro Seto (Kanazawa Institute of Technology), Masashi Yamabe (Kanazawa Institute of Technology)

Analysis of the Automatic Control System for Multistage Transmission with Electro-Pneumatic Shifting
Aleksandr Blokhin (Nizhny Novgorod State Technical University Russian Federation), Lev V. Barakhtanov (Nizhny Novgorod State Technical University), Evgenii A. Fadeev (Nizhny Novgorod State Technical University), Sergey L. Tropin (CJSC Corporate Carrier of Heavy Cargo Spetstyazhavtotrans)

Stress Prediction of a Military Vehicle Using Flexible Multibody Dynamics
Seul Gi Yoon (School of Mechanical Engineering, Republic of Korea), Sang-Do Na (School of Mechanical Engineering), Yeong-Jin Kim (School of Mechanical Engineering), Wan-Suk Yoo (Faculty of Mechanical Engineering Pusan National University)

16:30-17:30 Room I
Vender Session
Chair: Etsujiro Imanishi (Kobe Steel, Ltd.)

August 10, Wednesday

9:30-10:30 Main Hall
Keynote Lecture-II
Chair: Tsuyoshi Inoue (Nagoya University)

Geometric Formulation and Analysis in Multibody Dynamics
Hiroaki Yoshimura (Waseda University, Japan)

11:00-12:20 Room I
Flexible Multibody Systems-5
Chair: Shoichiro Takehara (Sophia University)

Relation between Posicast Shaper and Vibration Manipulation Function for Undamped 1DOF Linear Oscillator
Ryo Ichizaki (Mie University, Japan), Shigeo Kotake (Mie University), Yuichiro Kawakita (Mie University)

Modal Reduction in ANCF for Flexible Multibody Dynamics by Component Mode Synthesis Method
Yixuan Tang (Nanjing University of Aeronautics and Astronautics, China), Qiang Tang (Beijing Institute of Technology), Haiyan Hu (Nanjing University of Aeronautics and Astronautics / Beijing Institute of Technology)

Similarity Rules for Spin Deployment Membrane
Yuki Tatematsu (Nihon University, Japan), Tomohiro Suzuki (Nihon University), Masahiko Yamazaki (Nihon University), Yasuyuki Miyazaki (Nihon University)

A Meshfree Method Based on Radial Point Interpolation for the Research of a Flexible Beam in Large Deformation Situation
Yuanzhao Chen (Nanjing University of Science and Technology, China), Dingguo Zhang (Nanjing University of Science and Technology), Liang Li (Nanjing University of Science and Technology)

11:00-12:20 Room II
Modeling, Formalisms and Theoretical Approach in Multibody System Analysis-1
Chair: Ilie Talpasanu (Wentworth Institute of Technology)

Dynamics of Space Manipulator: Relative vs Natural Coordinates
Anil Kumar Sharma (Indian Institute of Technology Delhi, India), Subir Kumar Saha (Indian Institute of Technology Delhi)

Efficiently Modeling a Floating Spherical Buoy Using a Spherical Coordinate System
Xiangqian Zhu (Pusan National University, Republic of Korea), Wan-Suk Yoo (Pusan National University)

Application of the Hamiltonian Mechanics for Constrained Systems to the Euler-Bernoulli Beam Element for Development of Efficient Calculation Strategies
Kensuke Hara (Tokyo Institute of Technology, Japan)

Transfer Design from the Earth to the Moon in the Bielliptic 4-Body Problem
Kaori Onozaki (Waseda University, Japan), Hiroaki Yoshimura (Waseda University)

Conference Program

11:00-12:20 Room III
Optimization, Sensitivity, System Identification and Uncertainty-1
Chair: Hong Hee Yoo (Hanyang University)

Development and Optimal Design of a Telescopic Boom Lift for Nursing Care Using a Multibody Dynamics Approach
Yoshiko Yamaguchi (Fukuoka University, Japan), Makoto Iwamura (Fukuoka University), Hiroyuki Fujishima (Fukuoka University), Ittou Tanaka (Fukuoka University)

Optimal Control Based on Modified Genetic Algorithm for the Deployment Process of Scissor-Type Deployable Mast
Jieyu Ding (Qingdao University, China), Jianwen Liu (Qingdao University)

11:00-12:20 Room IV
Efficient Methods, Real-Time Applications and Hardware in the Loop Simulation-1
Chair: Sung-Soo Kim (Chungnam National University)

Improved Contact Tracking Algorithm for the Omni Wheel in General Case of Roller Orientation
Ivan I. Kosenko (Moscow Aviation Institute (National Research University), Russian Federation),
Sergey Ya. Stepanov (Dorodnicyn Computing Centre of Russian Academy of Sciences), Kirill V. Gerasimov (Lomonosov Moscow State University)

Dynamic Simulation of Rigid Body System Driven by Electric Motor Considering Magnetic Saturation
Takayuki Igaue (Kobe Steel, LTD., Japan), Kei Mortia (Kobe Steel, LTD.), Etsujiro Imanishi (Kobe Steel, LTD.)

13:20-15:00 Room I
Flexible Multibody Systems-6
Chair: Pascal Ziegler (University of Stuttgart)

Hyper-Elastic Thin Shells Based on ANCF for Flexible Multibody Dynamics Analysis
Kai Luo (Beijing Institute of Technology, China), Cheng Liu (Beijing Institute of Technology), Qiang Tian (Beijing Institute of Technology), Haiyan Hu (Beijing Institute of Technology)

Vibration Analysis of a Rotating Hub-Tapered Beam Based on B-Spline Interpolation Method
Jihua Fan (Jiangsu University of Science and Technology / Suzhou Institute of science and technology, China), Dingguo Zhang (Nanjing University of Science and Technology), Hong Shen (Jiangsu University of Science and Technology / Suzhou Institute of science and technology)

Dynamical Modeling and Simulation of Woven Fabric Structure Using ANCF
Jian Shen (Beijing Institute of Technology, China), Feng Han (Beijing Institute of Technology), Fang Chen (Beijing Institute of Technology), Qiao Zhou (Beijing Institute of Technology)

Dynamic Modeling of Bridge-Type Displacement Amplifier Utilizing Generalized Conic Flexure Model
Guimin Chen (Xidian University, China), Xiaoyuan Liu (Xidian University)

13:20-15:00 Room II
Modeling, Formalisms and Theoretical Approach in Multibody System Analysis-2
Chair: Kensuke Hara (Tokyo Institute of Technology)

Vibration Analysis of a Rotating Hub-Blade System Considering Bending-Torsion Coupling
Yutaek Oh (Hanyang University, Republic of Korea), Hong Hee Yoo (Hanyang University)

Modeling of a 6 Degrees of Freedom Robotic Mechanism for Micro and Nano Precision
Ilie Talpasanu (Wentworth Institute of Technology, United States of America), Florin Ionescu (Steinbeis University Berlin), Kostadin Gr. Kostadinov (Institute of Mechanics- Bulgarian Academy of Sciences)

Null Space Method of Differential Equation Type for Analysis of Multibody Systems (Application to Systems with Redundant Constraints)
Keisuke Kamiya (Aichi Institute of Technology, Japan)

Dynamical Modeling and Numerical Simulation of Multi-Rigid-Body System Based on Gaussian Principle of Least Constraint
Wenli Yao (Qingdao Technological University, China), Liusong yang (Qingdao Technological University)

13:20-15:00 Room III
Optimization, Sensitivity, System Identification and Uncertainty-2
Chair: Makoto Iwamura (Fukuoka University)

Optimum Values of Circuit Used in Energy Harvesting Using Piezoelectric Elements or DC Motors
Keisuke Yamada (Kansai University, Japan)

Statistical Approach to Fault Detection of Planetary Gears Using Transmission Error
Jungho Park (Seoul National University, Republic of Korea), Jong moon Ha (Seoul National University), Hyunseok Oh (Seoul National University), Byeng D. Youn (Seoul National University)

Sample Based Reliability Estimation and Design of a Multibody System Employing Extreme Value Theory
Chan Kyu Choi (School of Mechanical Engineering, Hanyang University, Republic of Korea), Hong Hee Yoo (Hanyang University)

13:20-15:00 Room IV
Efficient Methods, Real-Time Applications and Hardware in the Loop Simulation-2
Chair: Taichi Shiiba (Meiji University)

HILS System for the Electric Motor Using Coupling Analysis with Rigid Body System and Hydraulic System
Etsujiro Imanishi (Kobe Steel, Ltd., Japan), Kei Morita (Kobe Steel, Ltd.),

Conference Program

Multibody Dynamics and Control Model of 6 x 6 Unmanned Ground Vehicle for Real-Time Traversability Analysis
Hyosung Hong (Chungnam National University, Republic of Korea), Jongboo Han (Chungnam National University), Hajun Song (Chungnam National University), Samuel Jung (Pusan National University), Sung-Soo Kim (Chungnam National University), Mooncheol Won (Chungnam National University), Wan Suk Yoo (Pusan National University), Jongho Shin (Agency for Dense Development), Yong Woon Park(Agency for Dense Development)

Parallel Processing in the Dynamics Analysis of a Deep Seabed Integrated Mining System Using Subsystem Synthesis Method
Hajun Song (Chungnam National University, Republic of Korea), Jongboo Han (Chungnam National University), Sung-Soo Kim (Chungnam National University), Chang-Ho Lee (Korea Research Institute of Ships and Ocean Engineering), Hyung-Woo Kim (Korea Research Institute of Ships and Ocean Engineering), Sup Hong (Korea Research Institute of Ships and Ocean Engineering)

15:30-16:00 Main Hall
Closing Ceremony