



2017 INT'L CONFERENCE ON
ADVANCED AUTOMOTIVE TECHNOLOGY

5~8 July 2017

Kimdaejung Convention Center
Gwangju, Korea

< Final Program for Conference >

Overview of ICAT2017

- **Title:** 2017 International Conference of Advanced Automotive Technology
- **Homepage:** <http://www.icat-gj.org>
- **Dates:** July 5th (Wed.) ~ 8th (Sat.), 2017
- **Venue:** KDJ Convention Center, Gwangju, Korea
- **Official Language:** English, Korean
- **Organizers:** Automotive Research Center in Chonnam National Univ., Korea Automotive Technology Institute (KATECH), Gwangju Center for Creative Economy & Innovation, Gwangju Institute of Green-Car Advancement, Gwangju Techno-Park, Kimdaejung Convention Center, Gwangju Convention & Visitors Bureau
- **Sponsors:** Gwangju Metropolitan City, The Korean Society of Automotive Engineers (KSAE), CCEI Alliance (Future Automobile Sector), Korea Tourism Organization

ICAT2017 Organizing Committee

Chairman	Prof. Choi, Byungchul	Chonnam National University
Committee Members	Dr. Son, Gyeongjong	Gwangju Metropolitan City
	Dr. Lee, Chunhwan	Korea Automotive Technology Institute
	Prof. Park, Suhan	Chonnam National University
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	Mr. Lee, Sangsik	Gwangju Center for Creative Economy & Innovation
	Prof. Lim, Ocktaeck	University of Ulsan
	Mr. Kim, Yunjung	Gwangju Techno-Park
	Dr. Myong, Gwangjae	Gwangju Institute of Green-Car Advancement
	Mr. Kim, Eun-Tae	The Korea Society of Automotive Engineers

Conference Schedule

○ July 6 (Thursday), 2017

Room 304-306

Time	Contents	
08:00~	Registration	
08:30 ~ 08:50	Opening Ceremony	
Time	Speaker (Affiliation, Country)	Title
Internal Combustion Engine / Vehicle Control		
Session Chair: Prof. Tetsunori Haraguchi (Nagoya Univ., Japan)		
08:50 ~ 09:20	Sanghoo Kook (UNSW, Australia)	Advancing Science for Automotive Innovation: Fine Particles Formation in Diesel Engines
09:20 ~ 09:50	Tetsunori Haraguchi (Nagoya Univ., Japan)	Obstacle Avoidance Maneuver of Personal Mobility Vehicle with Lean Mechanism
09:50 ~ 10:20	Nicolas H. Younan (Mississippi State Univ., USA)	Sensors and Sensor Fusion for Smart Technologies
10:20 ~ 10:40	Coffee Break / Poster Session	
Fuel Cell Vehicle (FCV) Session - I		
Session Chair: Dr. Gil Sung Jeong (KATECH, Korea)		
10:40 ~ 11:20	Etienne Werlen (Air Liquide, Japan)	Advanced Hydrogen Refueling Station Technologies
11:20 ~ 12:00	Kwangjae Myung (GIGA, Korea)	Status of Gwangju Vehicle Industry, Development and Vision
12:00 ~ 14:00	Lunch / Poster Session	
Fuel Cell Vehicle (FCV) Session - II		
Session Chair: Prof. Akari Hayashi (Kyushu Univ., Japan) Prof. Seunghun Jung (Chonnam Nat'l Univ., Korea)		
14:00 ~ 14:40	Seungchan Oh (Hyundai Motor Company, Korea)	Current Status of Hyundai Fuel Cell Vehicle Development
14:40 ~ 15:20	Akari Hayashi (Kyushu University, Japan)	Development of PEFC Cathode Catalysts and Investigation of Their Degradation Mechanism
15:20 ~ 16:00	Byeong Soo Oh (Chonnam Nat'l Univ., Korea)	Status of FCV Research in Chonnam National University
16:00 ~ 16:40	Joongho Bae (Korea Transportation Safety Authority, Korea)	KMVSS and Developing Trends of EV & FCEV
16:40 ~ 17:00	Coffee Break / Poster Session	
Junior Oral Session - I		
Session Chair: Prof. Junepyo Cha (Korea Nat'l Univ. of Transportation, Korea)		
17:00 ~ 18:00	Sirion Pitanuwat (Nagoya Univ., Japan)	An Improvement of Power-Split Hybrid Powertrain Simulation Focusing on Hybrid Operation Characteristics and Fuel Consumption based on Real-World Driving Data
	Young Soo Yu (Korea National Univ. of Transportation, Korea)	Real Driving Emissions of Light-Duty Vehicles regarding to Trip Dynamics
	Gyeongho Park (Chonnam National Univ., Korea)	Optimization of T-Shape Nozzle for Uniform Gas Distribution for a Plate-Type Catalyst Combustor

Time	Contents	
08:00~	Registration	
Time	Speaker (Affiliation, Country)	Title
	Junior Oral Session - II	
	Session Chair: Prof. Yoshimitsu Kobashi (Hokkaido Univ., Japan)	
08:30 ~ 09:40	Yoshimitsu Kobashi (Hokkaido Univ., Japan)	CFD and Experimental Analysis on Combustion Similarity in Diesel Engines
	Seong In Jo (Chonnam National Univ., Korea)	Comparison of Combustion and Emission Characteristics of Diesel and Biodiesel with Intake Temperature
	Young Chan Lim (Kongju National Univ., Korea)	Possibility of Simultaneous Improvement of Homogenous Combustion and Emission Characteristics using Hydrocarbon Fuels in CI Engine
	Dong In Lee (Korea National Univ. of Transportation, Korea)	Effect of Ambient Temperature Conditions on Real Driving Emissions
09:40 ~ 10:00	Coffee Break / Poster Session	
	Electric Vehicle (EV) / Hybrid Electric Vehicle (HEV) Session	
	Session Chair: Prof. Ocktaeck Lim (Univ. of Ulsan, Korea)	
10:00 ~ 10:40	Gereon Meyer (VDI/VDE Innovation +Technik, Germany)	European Strategy Plans and Roadmaps for the Electrification of Road Transport
10:40 ~ 11:20	Yossapong Laonual (KMUTT, Thailand)	Progress on the Electric Vehicle Development in Thailand
11:20 ~ 12:00	Jakub Bernatt (KOMEL, Poland)	Electromobility in Poland - Current Achievements and Goals
12:00 ~ 13:30	Lunch / Poster Session / Green Car Exhibition	
	Weight Reduction / Vehicle Control	
	Session Chair: Prof. Suhan Park (Chonnam Nat'l Univ., Korea) Dr. Hyun Chul Lee (KATECH, Korea)	
13:30 ~ 14:10	Hideyuki Ogawa (Hokkaido Univ., Japan)	Potential and Awaiting Solution of Semi-Premixed Diesel Combustion with Twin Peak Shaped Heat Release
14:10 ~ 14:50	Jeongwoo Han (Argonne National Lab., USA)	Current and Future U.S. Light-Duty Vehicle Pathways : Cradle-to-Grave lifecycle greenhouse gas emissions and economic assessment
14:50 ~ 15:30	Dongun Kim (POSCO, Korea)	Advanced Roll Forming Technology for the Automotive Application using Giga Steel
15:30 ~ 16:10	Paul Moulard (Siemens Industry Software, British)	Reducing Vehicle Weight through the Use of Advanced Materials
16:10 ~ 16:30	Award Ceremony / Closing	

Junior Poster Session – July 6 (Thursday) ~ July 7 (Friday), 2017

Session Chair: Prof. Suhan Park (Chonnam Nat'l Univ., Korea)

Dr. Chunhwan Lee (KATECH, Korea)

- ICAT2017-01 **Development of PEFC Cathod Catalysts by Encapsulating Pt Particles into Carbon Mesopores**
Bo Fu, Akari Hayashi (Kyushu Univ., Japan)
- ICAT2017-02 **Investigation of Cathode Degradation on the PEFC Operation at Elevated Temperature**
Hidemasa Miyamoto, Akari Hayashi (Kyushu Univ., Japan)
- ICAT2017-03 **Analysis of Ash Loading Impact on Prototype Gasoline Particulate Filters (GPF)**
Seungmok Choi, Hee Je Seong (Argonne National Lab., USA), Jimmie L. Williams (Corning Incorp., USA), Bill Lam, Huifang Shao (Afton Chemical, USA)
- ICAT2017-04 **Comparison of Particulate Emissions from Advanced and Modern Conventional Combustion Engines Measured by SMPS, EEPS, and Micro Soot Sensor (MSS)**
Seungmok Choi, Hee Je Seong, Andrew Ickes, Stephen Ciatti, Khanh Cung (Argonne National Lab., USA), Sherrie Elzey (TSI Inc., USA)
- ICAT2017-05 **Spray Characteristics of Urea-SCR System according to Nozzle Shape Change**
Jeonghyun Park, Suhan Park (Chonnam National Univ., Korea), Joonho Jeon (Univ. of Minnesota, USA), Deuk San Kim, Ye Sung Kim, Kyung Jong Lee (W-ONE Co., LTD., Korea)
- ICAT2017-06 **Study on the Performance and Efficiency of FPSE according to the Variation of Heater Temperature**
Byunggyun Kim, Yeonguk Kim, Minseong Park (Chonnam National Univ., Korea), Joonho Jeon (Univ. of Minnesota, USA), Suhan Park (Chonnam National Univ., Korea)
- ICAT2017-07 **Study on the NO_x Reduction using CO₂ Dissolved Diesel Fuel**
Jungseok Go, Gilwon Kang, Jaeyong Park (Chonnam National Univ., Korea), Joonho Jeon (Univ. of Minnesota, USA), Suhan Park (Chonnam National Univ., Korea)
- ICAT2017-08 **A Study about the Effects of Exhaust Pressure to Prediction Temperature and Decomposition of NH₃ in SCR System**
Muhammad Khristamto Aditya Wardana, G. M. Hasan Shahariar (Univ. of Ulsan, Korea), Widodo Budi Santoso, Achmad Praptijianto, Arifin Nur (Indonesian Institute of Sciences, Indonesia), Ocktaeck Lim (Univ. of Ulsan, Korea)
- ICAT2017-09 **Numerical Study of Intake Port Effect on Direct Injection Gasoline Engine**
Bambang Wahono, Yanuandri Putrasari (Univ. of Ulsan, Korea), Widodo Budi Santoso, Achmad Praptijianto, Arifin Nur (Indonesian Institute of Sciences, Indonesia), Ocktaeck Lim (Univ. of Ulsan, Korea)
- ICAT2017-10 **A Study on Combustion and Emission of Gasoline-Biodiesel Blends HCCI Engines using EGR and Boosting Operation**
Yanuandri Putrasari (Univ. of Ulsan, Korea), Widodo Budi Santoso, Achmad Praptijianto, Arifin Nur (Indonesian Institute of Sciences, Indonesia), Ocktaeck Lim (Univ. of Ulsan, Korea)
- ICAT2017-11 **Hydrogen Production by DME Steam Reforming with Cu Based Catalyst for PEMFC**
Daeseok Kim, Byungchul Choi, Gyeongho Park (Chonnam National Univ., Korea), David Chiamonti (Univ. of Florence, Italy)
- ICAT2017-12 **Effective Parameters for Combustion Stability of a Catalytic Combustor**
Wonbin Jo, Cheonho Kim, Jinseon Kim, Byungchul Choi (Chonnam National Univ., Korea), Pilsoo Jeong (DAONRS Co., Korea), Feng-Ai Piao (Yanbian Univ., China)
- ICAT2017-13 **Numerical Analysis of Melting Phenomena of Frozen Aqueous Urea Solution by Heater Position**
Taewook Kim, Byungchul Choi (Chonnam National Univ., Korea), Feng-Ai Piao (Yanbian

Univ., China)

Combustion and Emission Characteristics of CO₂ Mixing Rates in a Natural Gas Engine for Electric Power Generation

ICAT2017-14 Yung Jin Kim, Jong Tae Lee (National Institute of Environmental Research, Korea), Eiji Tomita (Okayama University, Japan), You-Deog Hong (National Institute of Environmental Research, Korea)

Design Optimization of High Power Redox Flow Battery Stack

ICAT2017-15 Kangsan Kim, Daein Jeong (Chonnam National Univ., Korea), Soowhan Kim (Energy Plant Co., Ltd., Korea), Seunghun Jung (Chonnam National Univ., Korea)

Mathematical Model of Hybrid Battery System for Automotive Applications

ICAT2017-16 Huiseok Kim, Seunghun Jung (Chonnam National Univ., Korea)

Highly Selective and Sensitive Room Temperature CO Sensor Employing N-doped rGO-In₂O₃ Nanocubes

ICAT2017-17 S. Arunkumar, Dong-Weon Lee (Chonnam National Univ., Korea)

An Investigation of Solid-State Symmetric Supercapacitor based on Co₃S₄ Nanosheets Electrode

ICAT2017-18 Swati J. Patil, Dong-Weon Lee (Chonnam National Univ., Korea)

Kinematic Modeling of a Curvature-Controllable Steerable Needle using a Car-like Non-holonomic Model

ICAT2017-19 Binxiang Xu, Seong Young Ko (Chonnam National Univ., Korea)

Dynamic Characterization of Vibration Proofing Wheel

ICAT2017-20 Sujie Zhou, Jung Hweekwon, Choi Seongwon, Park Gyuhae (Chonnam National Univ., Korea)

High-Speed Image Processing for Crack Detection on Automobile Press Panels

ICAT2017-21 Yeseul Kong, Hweekwon Jung, Hoyeon Moon, Gyuhae Park (Chonnam National Univ., Korea)

System Identification and Force Tracking Control for the Electro-Hydraulic Servo System

ICAT2017-22 Hai-Bo Yuan, Young-Bae Kim (Chonnam National Univ., Korea)

Experimental Study on Energy Management System for Fuel Cell/Battery Hybrid Power System

ICAT2017-23 Kai Ou, Wei-Wei Yuan, Young-Bae Kim (Chonnam National Univ., Korea)

Real-Time Management of Humidity and Temperature of Polymer Electrolyte Membrane Fuel Cell

ICAT2017-24 Wei-Wei Yuan, Kai Ou, Young-Bae Kim (Chonnam National Univ., Korea)

Dynamic Modeling of Hydrogen Production by the DME Reformer with a Combustor for PEMFC

ICAT2017-25 Tie-Qing Zhang, Young-Bae Kim (Chonnam National Univ., Korea)

System Integration using the ROS (Robotics Operating System) for the Autonomous Navigation of Differential Drive Mobile Robots

ICAT2017-26 Ju-Min Kim, Saihan Lee, JunHyung Jo, Chang-bae Moon (Chonnam National Univ., Korea)

Research on the NO_x Reduction Efficiency of After-Treatment for Euro 6

ICAT2017-27 M. K. Kang, S. J. Kwon, Y. H. Seo (Korea Automotive Technology Institute, Korea)

Characteristics of Tire Rolling Resistance Coefficient according to Test Speed Variation

ICAT2017-28 J. W. Lee, S. J. Kwon, Y. H. Seo (Korea Automotive Technology Institute, Korea)

ICAT2017-29 **A Study on Emission Characteristics of In-Use Vehicles using Database of Inspection and**

Maintenance in Korea

Hyung Jun Kim, Jong Tae Lee, Hyun Goo Noh, You-Deog Hong (National Institute of Environmental Research, Korea)

An Analysis on Emission Characteristics of Trace Hazardous Materials from Passenger Vehicle Exhaust according to Various Emission Standard

ICAT2017-30

Jong Tae Lee, Hyung Jun Kim, You Deog Hong (National Institute of Environmental Research, Korea)

A Study of Dynamic Response Characteristics of a Solenoid used for Gaseous Fuel Injector

ICAT2017-31

Nguyen Ba Hung, Ocktaeck Lim (Univ. of Ulsan, Korea)

A Study on the Particle Size and Velocity Profile on a Gasoline Port Injector using a Phase Doppler Particle Analyzers (PDPA)

ICAT2017-32

Hyojin Kim, Hyun Jo, Sakda Tongchai, Ocktaeck Lim (Univ. of Ulsan, Korea)

A Numerical Study on Urea-Water Solution Spray Impingement on the Heated Wall of Automotive SCR DeNO_x-Systems

ICAT2017-33

G. M. Hasan Shahariar, Muhammad Khristamto Aditya Wardana, Ocktaeck Lim (Univ. of Ulsan, Korea)

A Study on Spray and Combustion Characteristics of Gasoline-Biodiesel Fuel Blends in a Constant Volume Combustion Chamber

ICAT2017-34

Shubhra Kanti Das, Ocktaeck Lim (Univ. of Ulsan, Korea)

Comparison of Energy Consumption in Electric Vehicle Equipped with Single- or Multi-Speed System of Power Transmission

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Tomasz Meinicke, Maciej Adamiński (BOSMAL, Poland), Jakub Bernatt (KOMEL, Poland)

Junior Oral Session - July 6 (Thursday) ~ July 7 (Friday), 2017

An Improvement of Power-Split Hybrid Powertrain Simulation Focusing on Hybrid Operation Characteristics and Fuel Consumption based on Real-World Driving Data

ICAT2017-36

Sirion Pitanuwat, Hirofumi Aoki, Takayuki Morikawa, Tetsunori Haraguchi (Nagoya Univ., Japan)

CFD and Experiment Analysis on Combustion Similarity in Diesel Engines

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Yoshimitsh Koboshi (Hokkaido Univ., Japan)

Comparison of Combustion and Emission Characteristics of Diesel and Biodiesel with Intake Temperature

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Seong In Jo, Dal Ho Shin (Chonnam National Univ., Korea), Joonho Jeon (Univ. of Minnesota, USA), Suhan Park (Chonnam National Univ., Korea)

Optimization of T-Shape Nozzle for Uniform Gas Distribution for a Plate-Type Catalyst Combustor

ICAT2017-39

Gyeongho Park, Taewook Kim, Daesuk Kim, Byungchul Choi (Chonnam National Univ., Korea), Osamu Fujita (Hokkaido Univ., Japan)

Possibility of Simultaneous Improvement of Homogeneous Combustion and Emissions Characteristics using Hydrocarbon Fuels in a CI Engine

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Young Chan Lim, Jun Woo Jung, Hyun Kyu Suh (Kongju National Univ., Korea)

Effect of Ambient Temperature Conditions on Real Driving Emissions

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Dong In Lee, Seung-Tak Oh, Junepyo Cha, Mun Soo Chon (Korea National Univ. of Transportation, Korea)

Real Driving Emissions of Light-Duty Vehicles regarding to Trip Dynamics

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Young Soo Yu, Mun Soo Chon, Junepyo Cha (Korea National Univ. of Transportation, Korea)