GS**AE**K

Graduate School of
Automotive Engineering

KMU KOOKMIN UNIVERSITY

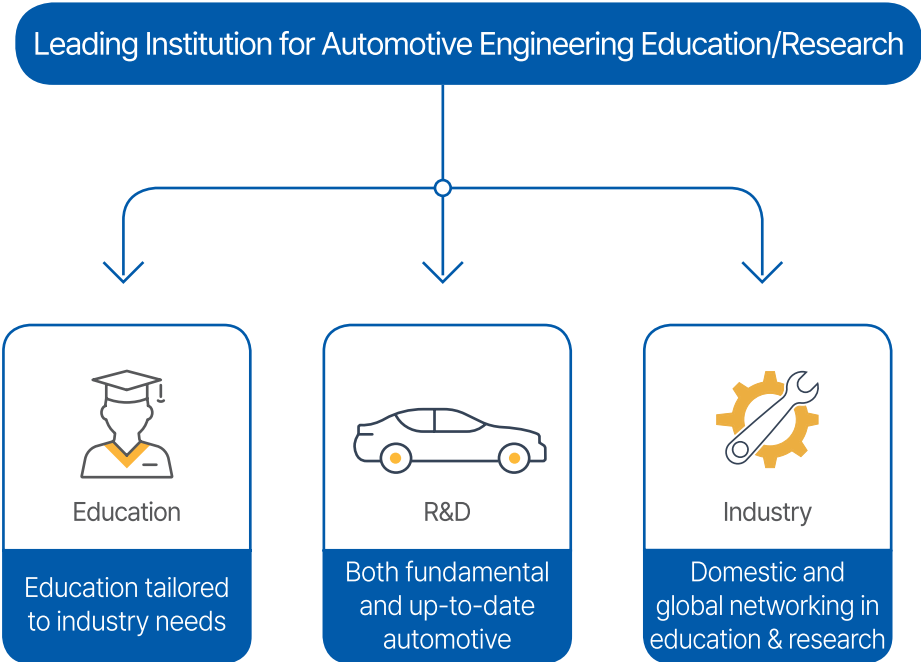# CONTENTS

MESSAGE FROM DEAN

In 1998, the Graduate School of Automotive Engineering, Kookmin University was established as the only government-accredited graduate school specializing in automotive engineering, in recognition of its unparalleled capabilities for conducting advanced education and R&D in the field of automotive engineering. Currently, 18 full-time professors are serving the graduate school with their extensive expertise and experiences outnumbering any other graduate schools in the field of automotive engineering in Korea. Our research activities cover the full spectrum of automotive engineering areas including engine, chassis, body, electronics, eco-friendly powertrain and future transportation systems and more. Every year, about 100 graduate students are actively pursuing their advanced degrees in our school and the GSAEK alumni - 102 Ph.D.s and 840 M.S's, as of 2023 - are playing important roles in leading industries and institutions as well. For their technical excellencies and highly regarded work ethics, many members from our school are greatly recognized and appreciated by their peers and colleagues within the societies, accordingly. Since the inception of GSAEK, our school has made significant contributions to educating advanced technologies for the automotive industries. We have made significant efforts to develop new curriculum covering the state-of-the-art automotive technologies and we have actively involved in incubating and conducting numerous industry and government sponsored research projects. Recently, our school is focusing more and more on the promotion of global collaboration with foreign institutes in both education and research. We have established academic exchange programs with universities in US, China, Japan, Canada, Vietnam and more. Not only that, we are also conducting cooperative research programs with universities and companies in many countries including US, China, Germany, and Australia. We will continue to dedicate ourselves to further advancement of automotive technologies using our excellent human resources, comprehensive facilities, and teaching and research capabilities.
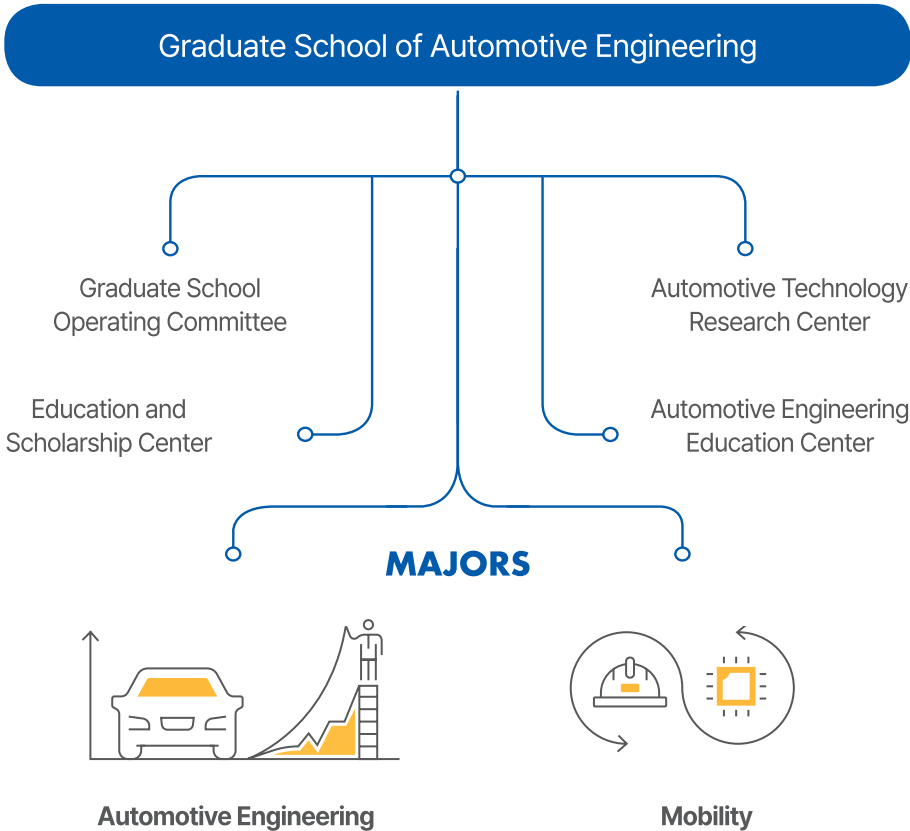
Graduate School of Automotive Engineering

Dean

VISION & ORGANIZATION

VISION

Leading Institution for Automotive Engineering Education/Research

Education	R&D	Industry
Education tailored to industry needs	Both fundamental and up-to-date automotive	Domestic and global networking in education & research

ORGANIZATION

Graduate School of Automotive Engineering

Graduate School Operating Committee

Automotive Technology Research Center

Education and Scholarship Center

Automotive Engineering Education Center

MAJORS

Automotive Engineering

Mobility

LABORATORY FACILITIES

AUTONOMOUS VEHICLES

DRIVING SIMULATOR

STEERING HILS
(Hardware In-the Loop Simulation)

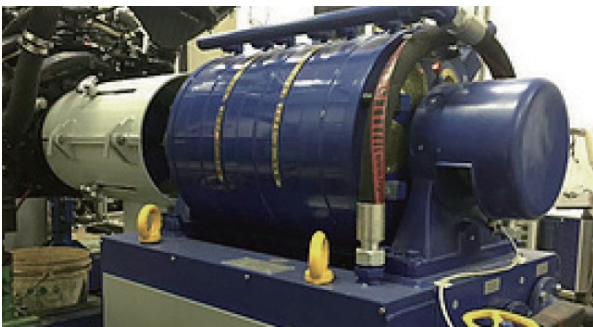IPG Automotive GmbHision

1/10 TRACK
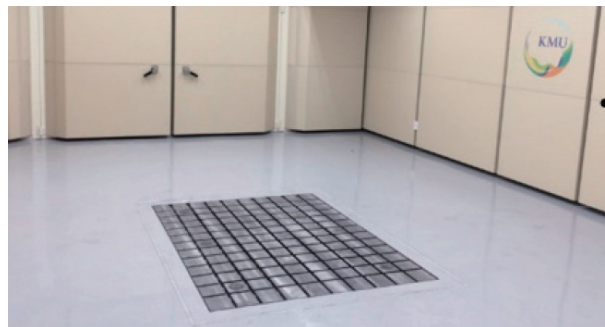

MOTOR DYNAMOMETER

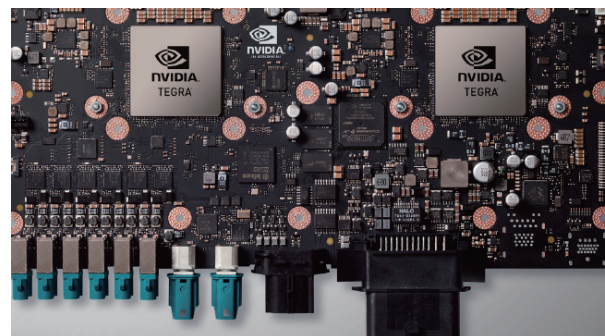## ENGINE DYNAMOMETER

AVL DP 240

SEMI-ANECHOIC CHAMBER

3-AXIS ROAD SIMULATOR

Corner Module Durability Tester

NVIDIA DRIVE PX 2

AI Autonomous Vehicle Computing Platform

CURRICULUM

Major Elective Courses		
	Vehicle Body Structural Design	Special Topics in EV & VCUI
	Computer Aided Vehicle Design	Special Topics in EV & VCUII
	Special Topics in Vehicle Body Design	Electrical Storage Systems for PHEV/EV
	Vehicle Vibration	Electric Motor Theory and Application
	Vehicle Dynamics	Automotive Power Electronics
	Special Topics in Vehicle Chassis Design	Motor Control
	Advanced Mechatronics	FEM in Automotive Engineering
	Robotics	Light Weight Materials Forming Analysis
	Advanced Mathematics	Theory of Plasticity
	Advanced Internal Combustion Engine	Carbon Composite Parts Design Theory
	New Energy Vehicles	Noise and Vibration Control
	Intake & Exhaust Systems	Random Data
	Digital Signal Processing	Sound Quality and Its Application
	Control Theory in Automotive Engineering	Vehicles Control Theory and Application
	Modeling and Simulation	Automated Driving HMI (Human-machine Interaction)
	Advanced Artificial Intelligence Machine Learning	Introduction to Vehicle Driver Modeling
	Deep Learning	Automotive Human Factors Engineering
	Advanced Deep Learning and IT Convergence	Cyber-physical Systems
	Powertrain System Dynamics	Real-time Embedded Systems
	Powertrain Tribology	In-vehicle Computing Systems
	Power Transfer Controls in Automotive Powertrain	Advanced Transportation Engineering
	Study in Powertrain System	Automotive Big Data System
	Electrified Powertrain Design	Autonomous Driving Recognition and Decision
	Engineering Acoustics	Vehicle Air Pollution
	Advanced Hybrid and Electric Vehicle I	System Engineering
	Special Topics in Internal Combustion Engines	Tyre Dynamics
	Special Topics in Vehicle Air Pollution	Vehicle System Engineering
	Linear Control System	Vehicle Functional Safety
	Kalman Filter Application in Automotive EngineeringA	Vehicle Safety Analysis

Common Elective Courses	
	Selected Topics in Doctoral Thesis
	Doctoral Thesis I, II
	Design of Experiments
	Automotive Technology Management
	Automotive Convergence Seminar I, II
	Intelligent Safety Control System
	Special Topics in Intelligent Vehicle
	Special Topics in Environmentally Friendly Vehicle
	Entrepreneurship

STUDENT ACTIVITIES

COMPETITIONS

1 | 2022 KSAE Endurance Event (E-Formula)

2 | 2022 KSAE Endurance Event (C-Formula)

3 | 2022 KSAE Gymkhana Event (E-Formula)

4 | 2022 KSAE Gymkhana Event (C-Formula)

5 | 2021 KSAE Grand Prix Formula

6 | 2022 KSAE Grand Prix Formula

AWARDS

2022   KSAE Grand Prix Formula (Ministry of Trade and Industry Award), Participation Award

2021   KSAE Grand Prix Formula (Ministry of Trade and Industry Award), Design Bronze Award

2020   KSAE Formula Overall 1st, Participation Award

2019   Shell Eco Marathon Asia, Urban-battery 7th

2019   Formula SAE Competition in MIS, Overall 35th, Design Event 8th

2019   KSAE Formula Overall 1st, 2nd, Dassault System 3D Experience Campion, Women's Best Engineer Award

2018   Shell Eco Marathon Asia, Urban-battery 4th

2018   Formula SAE Competition in MIS, Overall 20th, ACC 3rd, FEV Powertrain Design Award 2nd

2018   The Institute of Electronics & Information Engineers Conference Paper Award by Hyundai Motor Group

2018   KSAE Formula Overall 1st, 3rd, Women's Best Engineer Award

2017   Shell Eco Marathon Asia, Urban-battery 4th

2017   Formula SAE Competition in MIS, Overall 11th, Skid 7th

2017   KSAE Formula Overall 1st, 2nd, NVH Noise Award, Altair Design Award, Women's Best Engineer Award

2016   KARA Gymkhana Final Round, Overall 1st, 2nd

KOOKMIN RACING

STUDENT ACTIVITIES

COMPETITIONS

1 | 2022 Future Mobility Urban Challenge
2 | FMTC Practice Driving
3 | 2022 FMUC, 2022 KUUVe
4 | 2023 KMU Univ, 2023 KUUVe

AWARDS

2022	Future Mobility Urban Challenge, 3rd
2022	Mando & HL aMAP Morai, 2nd
2022	Mando & HL aMAP AA 1/5 Scale, 2nd
2022	KASA Autonomous Driving Competition, 1st
2022	IEVE Expo Autonomous Driving Competition ADSC, 2nd
2022	IEVE Expo Autonomous Driving Competition 1/5 scale, 1st
2022	University Future Innovation Group Autonomous Driving Competition, 2nd
2021	Hanium ICT Competition, 2nd
2021	Mando Autonomous Mobility Festival ADSC, 1st
2021	KMU Autonomous Driving Competition, 2nd
2021	KASA Autonomous Driving Competition, 5th
2020	PAMS Autonomous Driving Competition, 1st
2019	PAMS Autonomous Driving Competition, 1st
2019	KASA Autonomous Driving Competition, 3rd
2018	KASA Autonomous Driving Competition, 3rd

KUUVe

PROFESSOR PROFILES

Professor
Jung ha Kim

Laboratory
KUL, Unmanned Vehicle Research Lab.

http://kul.kookmin.ac.kr

EDUCATION

- University of Pennsylvania, Mechanical Eng. & Applied Mechanics, Ph. D.
- University of Cincinnati, Mechanical Eng., M.S.
- Sungkyunkwan University, Mechanical Eng., B.S.

EXPERIENCE

- Professor, College of Automotive Eng., Kookmin University. (1994~Present)
- Dean, College of Automotive Eng., Kookmin University. (2016~2017)
- CEO, Unmanned Solution. (2007~2012)
- Chairman, Kookmin University. Automobile Technology Research Center. (2009~2012)
- Chairman, Kookmin Unmanned Vehicle Robot Research Center. (2008~2009)
- Courtesy Professor, University. of Florida, Dept. of Mechanical & Aerospace Eng. (2000~2003)
- Researcher, Robotics Laboratory, Research Institute of Industrial Science & Technology (RIST)

RESEARCH AREAS

- Standardization & Architecture for Autonomous Vehicle.
- Autonomous Vehicle to Infrastructure System.
- System Integration for Autonomous Vehicle.
- Data Processing and Management about Perception/Localization/Planning/Control.
- Advanced Driver Assistance System.
- Sensor Network Technologies about Autonomous System.

RESEARCH ACTIVITIES

- The development of an autonomous minibus and obtaining temporary autonomous vehicle operation permits (2022)
- Development of LAS MMS Calibration Algorithm, Funded by Hyundai MNSoft. (2018~)
- Development of Decision Making/Control Technology of Vehicle/Driver Cooperative Autonomous Driving System (Co-pilot) based on ICT, Funded by Ministry of Knowledge & Economy. (2012~2017)
- The Development of Low-cost Autonomous Navigation System for a Robot Vehicle in Urban Environment, Funded by Ministry of Knowledge & Economy. (2010~Present)
- Autonomous Vehicle Competition, Funded by NGV. (2009~Present)
- Research of Unmanned Ground Vehicle, Funded by Hyundai Rotem. (2008~2010)
- Steering System Design for Autonomous Driving of Online Electric Vehicle, Funded by KAIST. (2009)
- The Manufacture Education of Unmanned Ground Vehicle for Using GPS, Funded by KAIST. (2009)
- The Research of Intelligent Planning Algorithm for Unmanned Ground Vehicle in Terrain,Funded by Agency for Defense Development. (2007~2009)
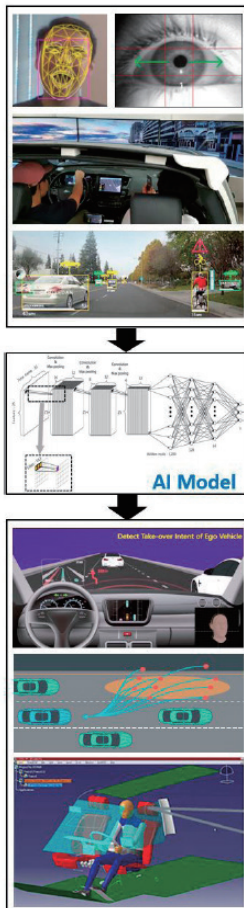
PROFESSOR PROFILES

Professor

Sang Hun Lee

Laboratory

Intelligence and
Interaction Lab.

ii.kookmin.ac.kr

EDUCATION

- Seoul National University, Mechanical Design & Production Eng., Ph.D. (1993)
- Seoul National University, Mechanical Design & Production Eng., M.S. (1988)
- Seoul National University, Mechanical Design & Production Eng., B.S. (1986)

EXPERIENCE

- Kookmin University, Professor. (1996~Present)
- Institute for Advanced Eng., Senior Researcher. (1996)
- Sindo Ricoh Co., Senior Researcher. (1993~1995)
- Carnegie Mellon University, Visiting Scholar. (2011~2012)
- Society for Computational Design & Engineering, President (2018)
- Journal of Computational Design & Engineering, Co-Editor-in-Chief (2017~Present)

RESEARCH AREAS

- Artificial Intelligence (AI) for Autonomous Vehicles.
- Human-centered Intelligent System.
- Deep Learning & Machine Learning Applications to ADAS & Autonomous Vehicles.
- Human-Machine Interaction (HMI) & Human-Vehicle Interaction. (HVI)
- Naturalistic Driving Study. (NDS)
- Computer-Aided Design & Manufacturing. (CAD/CAM)

RESEARCH ACTIVITIES

- A Study on Mode Confusion in Multi-level Autonomous Vehicles, NRF (2020~Present)
- Detection of Objects with Driver's Attention using Sensor Fusion and Eye Tracking System, Ministry of Education(2020)
- Detection of Surrounding Vehicles Using Deep Neural Network & Fusion of Panoramic Camera & LIDAR Sensor, Ministry of Education. (2019)
- Development of Deep Learning based Driver Intent Inference System on Highways, NRF. (2017~2019)
- Defensive Driving System using Machine Learning Technique, Ministry of Education. (2016)
- Automatic Design & Optimization of Cooling Channels in Hot Stamping Dies, Kia Motors. (2016~2017)
- Virtual Verification of Automotive Welding Jig Models, Ministry of Education. (2016~2017)
- Virtual Design & Training System by Digital Human Modeling, NRF. (2013~2016)
- Multi-attention-based Soft Partition Network for Vehicle Re-identification, Journal of Computational Design and Engineering. (2023)
- Mode Confusion of Human-Machine Interfaces for Automated Vehicles, Journal of Computational Design and Engineering (2022)
- User Interface for In-Vehicle Systems with On-Wheel Finger Spreading Gestures and Head-Up Displays, Journal of Computational Design and Engineering (2020)
- SBNet: Segmentation-based Network for Natural Language-based Vehicle Search, Proc. of IEEE/CVF Conference on Computer Vision and Pattern Recognition (2021)
- StRDAN: Synthetic-to-Real Domain Adaptation Network for Vehicle Re-Identification, · Proc. of IEEE/CVF Conference on Computer Vision and Pattern Recognition (2021)

PROFESSOR PROFILES

Professor

Siyoul Jang

Laboratory

PowerTrain Design &
Tribo-Cotrol Lab.

powertrain.kookmin.ac.kr
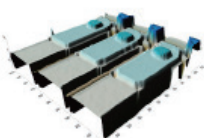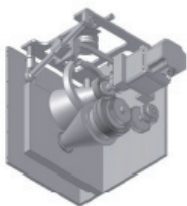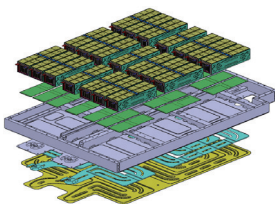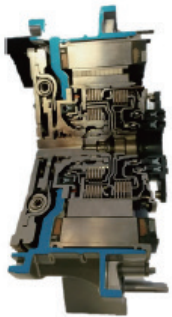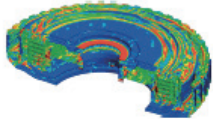
EDUCATION

- Rensselaer Polytechnic Institute, Ph.D. (Tribo-control & Powertrain Design) (1995)
- Seoul National University, Mechanical Design, M.S. (1988)
- Seoul National University, Mechanical Design, B.S. (1986)

EXPERIENCE

- MIT, Post-doctoral Research Associate. (1995~1997)
- KIST, Robot & Fluid Power Research Center. (1990~1991)
- Daewoo Heavy Industries, Ltd. Central Research Center. (1988~1990)

RESEARCH AREAS

- Intelligent Electrified Transmission Design. (Automatic TM, CVT, DCT, DHT Design & Control)
- Hybrid Power Transfer System in Automobile.
- EV Battery Packaging Design
- Electrified Powertrain Dynamics and Tribo-system Control.
- Clutch Torque Transfer Control in Automobile System.
  (Hyundai Collaborative Research Center)

RESEARCH ACTIVITIES

- Frictional Torque Characteristics on the Slip-porous Boundary of Wet Friction Pad. (NRF)
- Lubricated Contact Characteristics of Engineered 3D Tribo-contact Surfaces. (NRF)
- Boundary-Elastohydro Dynamic Lubrication System. (Korea-Czech Republic, Int.-collaboration Research)
- Elastohydro Dynamic Lubrication System in Automobile Powertrain.
  (Korea-Univ. of Leeds UK, Int.-collaboration Research)
- Anti-shudder Lock-up Clutch Design in High Performance Torque Converter. (Valeo-KAPEC, Co.)
- Continuously Variable Transmission Design. (Hyundai Dymos-powertec, Co.)
- Wet Type Dual Clutch Transmission (DCT) Development. (Hyundai Dymos-powertec, Co.)
- Torque Converter Development in High-stage Automatic Transmission System.(Valeo-KAPEC, Co.)
- Optimized Lubrication Circuit Design in Powertrain System. (Hyundai Motors Co.)
- Main-Shaft System Design in DCT. (Hyundai Motors, Co.)
- Piston Ring Design for High Fuel Efficiency. (Hyundai Motors, Co.)
- Mutigrade Lubricant Design for Fuel Efficiency in Powertrain System. (GS-caltex, Co.)
- Sealing System for Fuel Cell Stacking System. (Hyundai Motors, Co.)
- Clutch Torque Transfer Control in Electricfied Automobile System.
  (Hyundai Collaborative Research Center)
- Analysis of Residual Layer Thickness of Resin in an Imprinting Process using a Soft Mold, Electronic Materials Letters.
- Temperature Developments during UV Imprinting Process, J. of Nanoscie. & Nanotech.
- Fast Cure Kinetics of a UV-curable Resin for UV Nano-imprint lithography: Phenomenological Model Determination based on Differential Photocalorimetry Results, Thermochimica Acta-cone Ring Transmission Design, Korea Patent.
- Friction Pad of Wet Clutch Pack System for Reducing Drag Torque, Korea Patent.
- Wet Single Clutch Engagement Behaviors in DCT System, IJAT.

PROFESSOR PROFILES

Professor

Hyung Seok Kook

Laboratory

NVH & Sound Design Lab.

http://nvh.kookmin.ac.kr

EDUCATION

- Purdue University, Mechanical Eng., Ph.D.
- Seoul National University, Mechanical Design & Production Eng., M.S.
- Seoul National University, Mechanical Design & Production Eng., B.S.

EXPERIENCE

- Professor, Kookmin University. (1998~Present)
- University of Florida, Visiting Scholar. (2006~2007)
- Ray W. Herrick Laboratories, Post-Doctoral Research Associate/ Visiting Scholar. (1997~1998)

RESEARCH AREAS

- Researches on NVH Test & Evaluation Procedures.
- Simulation and Synthesis of Wind, Road Noises. (NVH Simulator)
- Control of Noise and Vibration.
- Sunroof Active Noise Control.
- Development of New NVH Measurement & Test Methods.
- Design of Arrays of Microphones for Acoustic Beamforming.
- Visualizations of Sound Field Using an Array of Microphones

RESEARCH ACTIVITIES

- "Development of Fundamental Technologies for Balancing Vehicle Interior Noise of Green Cars", Funded by Hyundai-Kia Motors. (2014~2017)
- "Development of a Panel Neck Inspection Technique based on Vibration Measurement",Funded by Hyundai-Kia Motors. (2016~2017)
- "Development of Wind Noise Evaluation Process Considering Turbulent Winds on Roads", Funded by Hyundai-Kia Motors. (2010~2011)
- "Sunroof Active Noise Control Technique" Funded by Hyundai-Kia Motors. (2008~2009)
- H.-S. Kook, S.-H. Park, J. Cho, and K.-D. Ih, "Development of an Active Deflector System for Sunroof Buffeting Noise Control," Journal of Vibration and Control Vol20 No16, 2521-2529. (2014)
- H.-S. Kook, S.-H. Park, & K.-D. Ih, "Spectral Decomposition of a Turbulence-excited Vibroacoustic System," Journal of Sound and Vibration Vol 332, 1388-1404. (2013)
- H.-S. Kook, D.Lee, and K.-D. Ih, "Vehicle Interior Noise Model based on a Power Law", International Journal of Automotive Technology Vol12 No5, 777-785. (2011)

Professor

Seang Wock Lee

Laboratory

Advanced Mobility Propulsion Lab.

https://cms.kookmin.ac.kr/mobilitypropulsion

EDUCATION

- Waseda University, Mechanical Eng., Ph.D.
- Kookmin University, Mechanical Eng., M.S.
- Kookmin University, Mechanical Eng., B.S.

EXPERIENCE

- Kookmin University, Professor. (2005.3)
- National Traffic Safety and Environment Lab. Research Fellow. (2003~2005)
- Waseda University, Teaching Assistant. (2000~2002)

RESEARCH AREAS

- Thermal Dynamics.
- Spray & Combustion Visualization.
- Internal Combustion Engine & Alternative Fuel Engine.
- PM & NOx emission After-treatment System. (LNT, SCR, DPF)
- Unmanned Aerial Vehicle Reciprocating Engine & Gas Turbine Engine.

RESEARCH ACTIVITIES

- Development of reciprocating engine for aircraft. (2022~)
- Development of Diagnosis and Monitoring Technology for Post-processing Equipment of Diesel Vehicles, Funded by Ministry of Environment. (2020~2022)
- Development and demonstration of DPF/SCR for simultaneous PM/NOx reduction of emergency generator with active temperature control system, Funded by Ministry of Environment. (2020~2022)
- Nondestructive Measurement of DPF Failure Using CR X-ray Imaging Technique, Funded by Ministry of Environment. (2018~2019)
- Development of Selective Catalytic Reduction (SCR) System for Heavy-Duty Vehicles, Funded by Ministry of Environment. (2016~2017)
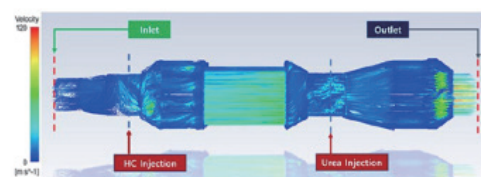- Development of SCR algorithms for Clean Diesel Engines, Funded by Ministry of Trade,Industry & Energy. (2011~2016)

UAV
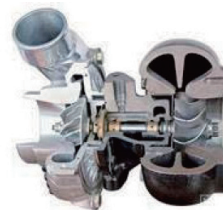
Turbo-charger
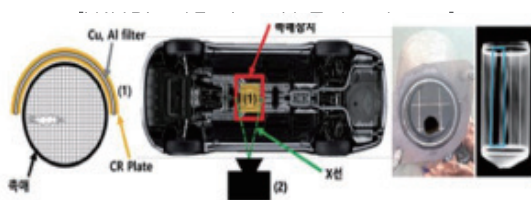
[Study on DPF Damage with X-ray Imaging Technique]   [CFD Analysis of After-Treatment System for Diesel Engine]

PROFESSOR PROFILES

Professor
Yeonsik Kang

Laboratory
Vehicle Intelligence Lab.

http://vilab.kookmin.ac.kr

EDUCATION

· University of California Berkeley, Mechanical Eng., Ph.D. (2001~2006)
· Seoul National University, Naval Architecture and Ocean Eng., M.S. (1999~2001)
· Seoul National University, Naval Architecture and Ocean Eng., B.S. (1993~1999)

CAREER

· Professor, Automotive Eng., Kookmin University. (2010~Present)
· Visiting Scholar, University of California Berkeley. (2016)
· Senior Research Scientist in Center for Cognitive Robotics, Korea Institute of Science & Technology. (KIST) (2007~2010)
· Postdoctoral Researcher in Center for Collaborative Control of Unmanned Vehicles in University of California Berkeley. (2006~2007)

RESEARCH AREAS

· Autonomous Driving.
· Advanced Driver Assistance System.
· Automotive Radar Tracking Algorithm.
· Nonlinear Model Predictive Control.
· Probabilistic Data Association Filter.
· Multiple Sensor Fusion.

RESEARCH ACTIVITIES

· "Research of Sensor Fusion Method Using Low Level Deep Learning by Camera and Lidar Sensor For Autonomous Driving", Hyundai Mobis. (2022-2023)
· "Development of Object Detection and Tracking Method Using Deep Learning-based Semantic Gria Map, Hyundai Motors, (2022~2023)
· "Development Autonomous Driving Technology based on Deep Learning Method Using URban Driving Data and Dynamic Occupancy Grid Map", National Science Foundation. (2021~2024)
· "Development of Object Detection and Tracking Method Using Dynamic Occupancy Grid Map", Hyundai Motors, (2021~2022)
· "Research of Sensor Fusion Method Using Dynbamic Occupancy Grid Map For Unitied Detection of Static and Moving Objects", Hyundai Motors,. (2020~2021)
· "Development of Autonomous Calibration and Lane Detection Method for Automotive 3D Lidar Sensors", Hyundai Mobis. (2019~2020)
· "Drift Control Strategy for High Performance Autonomous Vehicles Using Learning-based Techniques" National Science Foundation. (2018~2021)
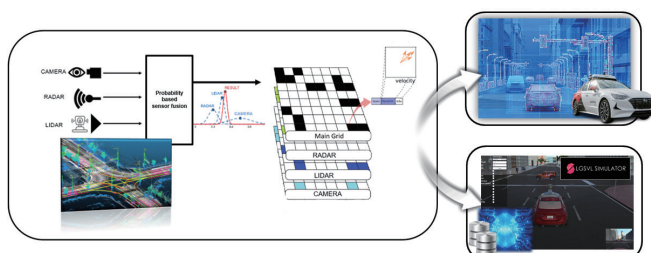
Deep Learning-based Sensor Fusion for Autonomous Driving

Autonomous Driving Experimental Vehicle Platform

PROFESSOR PROFILES

Professor

Woongchul Choi

Laboratory

xEV Systems Lab.

http://xev.kookmin.ac.kr

EDUCATION

- The Ohio State University, Mechanical Eng., Ph.D.
- The Ohio State University, Mechanical Eng., M.S.
- Seoul National University, Mechanical Eng., B.S.
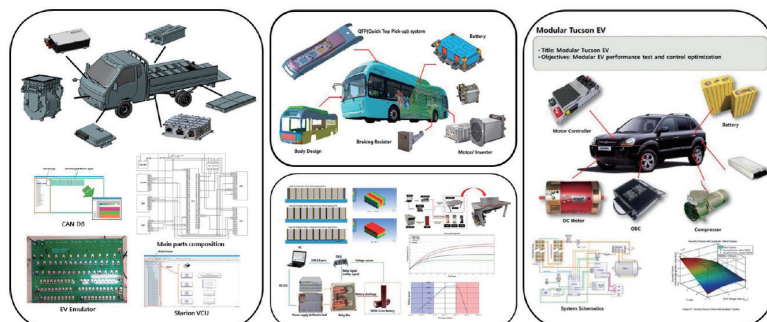
EXPERIENCE

- Full Professor, Kookmin University. (2010~Present)
- Adjunct Professor, The Ohio State University. (2003~2010)
- Lead Researcher, IFCT, Inc. (1993~2010)

RESEARCH AREAS

- System Integration for xEV Applications.
- Evaluation and Prediction of Battery Performance and Durability Characteristics.
- Energy Storage Modeling for Predictive Durability Analysis.
- Smart E-bus with Battery Swapping Technology.
- Battery Thermal Management System.
- SOC Measurement Technique with Impedance Tracking Algorithm.

RESEARCH ACTIVITIES

- "System Level Benefit Analysis based on the Cell Level Thermal Management System Utilizing Graphite based New Material", SKC. (2017~2018)
- "Renovation of Used 1-Ton Truck Equipped with Bi-Directional OBC to Function as an ESS for Microgrid System", Starion. (2017~2018)
- "Research to Analyze the Effects of Current Flow Improvement Device to a Li-Ion Battery Cells", MSS. (2017~2018)
- "Smart e-bus Project (Battery Swappable Electric Bus with Quick Top Pick-up (QTP) Module& Quick Change Module)", Funded by Ministry of Land, Transport and Maritime Affairs.(2010~2013)
- "Bi-directional Quasi Z Source Inverter for EV Traction Applications", Joint R&D Project with the Ohio State University. (2011~2012)
- "A Mini-scale Eco-system Modeling Consisting of a (1) EV, (2) a Residential Electric Load Profile, (3) a Wind Turbine, (4) Photovoltaic Panels, (5) Batteries for ResidentialApplications", Joint R&D Project with the Ohio State University. (2010~2012)
- "A Proof-of-concept Vehicle Implementation with a Hybrid Power Management System Integrating Solar Cells & a Battery System", Funded by a Private Co. (2009~2010)

PROFESSOR PROFILES

Professor

Geun Ho Lee

Laboratory

Electric Motor Control Lab.

http://motor.kookmin.ac.kr

EDUCATION

· Hanyang University Automotive Eng., Ph.D.
· Hanyang University Electric Eng., M.S.
· Hanyang University Electric Eng., B.S.

EXPERIENCE

· Kookmin Univ. Automotive Eng., Dept. (2011~)
· Gyeongnam Provincial College. (2002~2011)
· LG Industrial Systems Co. Senior Engineer. (1944~2002)

RESEARCH AREAS

· AC Motor Control. (IPMSM, Induction Motor)
· Power Electronics. (Inverter H/W Design)
· Motor Driver S/W.
· DSP Application.
· Motor Control for Hybrid Vehicle & Electric Vehicle.

RESEARCH ACTIVITIES

· Advance Development of Noise Reduction Control Logic of Electric Engine Oil Pump.
  (2018~2019, HMC)
· Development of One Shunt Vector Control Algorithm. (2018, Iginnotek)
· Development of IPMSM Drive Logic. (2017, Hyundai Autron)
· Development of Inverter-driven Super Premium Synchronous Reluctance Motor.
  (2016~2018, MOTIE/KETI)
· Development of 48V Power-based 800W EPS Motor Module Parts.
  (2015~2018, MOTIE/WOORY)
· Development of 80kW-winding Synchronous Electric Motor System for Electric
  Power Vehicles. (2015~2018, MOTIE/mcsys)
· Developmnet of Algorithm and Software for Engine Power Generation, Power
  Control System for LV148. (2014~2017, MSS/egtronics)
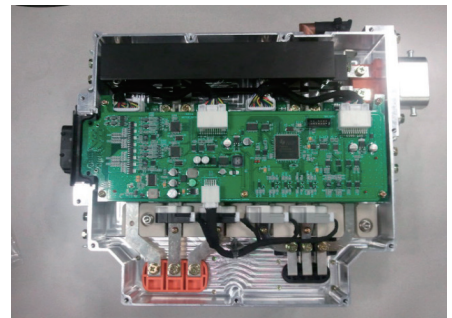
Professor

Heung Kyu Kim

Laboratory

Structure & Forming Design Lab.

http://forming.kookmin.ac.kr

EDUCATION

- Seoul National University, Mechanical and Aerospace Eng., Ph.D.
- Seoul National University, Mechanical Design and Production Eng., M.S.
- Seoul National University, Mechanical Design and Production Eng., B.S.

EXPERIENCE

- Professor, Kookmin University. (2012~Present)
- Senior/Principal Researcher, Korea Institute of Industrial Technology. (2003~2012)
- Special/Visiting Researcher, Institute of Advanced Machinery & Design, Seoul National University. (2001~2003)
- Visiting Scholar, Portland State University, USA (2018 – 2019)

RESEARCH AREAS

- Structural Analysis & Optimal Design of Automotive Components.
- Design of Automotive Parts Manufacturing Process Using Lightweight Materials. (Carbon Composites, Light Metals, Hot Stamping)
- Development of Advanced Finite Element Analysis Technique Using Multi-scale Material Models. (Crystal Plasticity & Strain-gradient Models)

RESEARCH ACTIVITIES

- Development of Higher-order Hyperelastic Constitutive Model & Durability AnalysisTechnology for Reliable Prediction of Rubber Part Life, Funded by Ministry of Education.(2017~)
- Development of Panel Neck Inspection Technology based on Vibration Measurement, Funded by Hyundai-kia Motors. (2016~2017)
- Textured Structure Design by Structural Analysis of Architectured Material, Funded by Ministry of Science, ICT & Future Planning. (2016~)
- Correlation Between Press Bolster Deflection & Formability, Funded by Hyundai-Kia Motors. (2015~2016)
- Study on Influence Factors of Hot Stamping Material and Process, Funded by Hyundai Steel. (2015~2016)
- Development of Strength Analysis Method Considering Forming Effect, Funded by Hyundai Mobis. (2014~2015)
- Development of Excessively Deformed Element Control Technology, Funded by Hyundai Mobis. (2013)
- Prediction of Mechanical Properties of Powder Metallurgy Alloys, Funded by Hyundai-Kia Motors. (2013~2014)
- Development of High-speed Molding Technology of Continuous CFRP Prepreg Composite for Automobile Lightweighting, Funded by Ministry of Trade, Industry & Energy. (2014~2017)
- Development of Finite Element Program based on Strain Gradient Crystal Plasticity for Prediction of Grain Deformation, Funded by Ministry of Education. (2013~2016)

PROFESSOR PROFILES

Professor

Sung Hwan Shin

Laboratory

Applied Acoustics and Vibration Control Lab.

http://a3vc.kookmin.ac.kr/

EDUCATION

- KAIST, Mechanical Eng., Ph.D. (2004)
- KAIST, Mechanical Eng., M.S. (1999)
- KAIST, Mechanical Eng., B.S. (1997)

EXPERIENCE

- Professor, Kookmin University. (2013~Present)
- Senior Researcher, Korea Atomic Energy Research Institute. (2008~2013)
- Post Doctoral Researcher, Seikei University. (2005~2008)
- BK21 Post Doctoral Researcher, KAIST. (2004~2005)

RESEARCH AREAS

- Product Sound Quality, Psycho-acoustics.
- Noise & Vibration Control. (NVH)
- Machinery Monitoring & Diagnostics.
- Signal Processing, Pattern Recognition, Room Acoustics, Reproduction System.
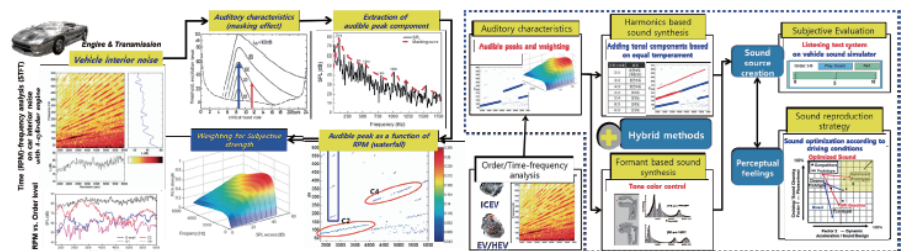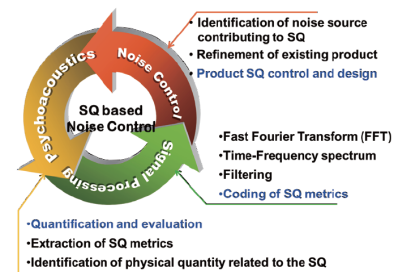
[Sound Quality Evaluation & Prediction]   [Sound Design & Refinement]

RESEARCH ACTIVITIES

- "ANC of High Frequency Noise interior Vehicle", Funded by Hyundai Motor Co. (2022~2023)
- "Monitoring and Diagnosis of Abnormal State of PT and PE", Funded by Hyundai Motor Co. (2021~2022)
- "Sound Quality of Engine Noise", Funded by Hyundai Motor Co. (2018~2019)
- "Development of Signal Processing Algorithm for Diesel Engine Vibration Reduction", Funded by Hyundai KEFICO. (2018)
- Development of Sound Field Control System for Realizing Personal Sound Zone in Vehicl Interior", Funded by KEIT. (2017~2020)
- "Sound Quality based Quantification Method of Vehicle Interior Noise", Funded by Hyundai Motor Co. (2017~2018)
- "Evaluation of Transmission Loss of Lightweight and Thin Laminated Glass",Funded by LG Chem. (2016~2018)
- "Sound Quality Evaluation of Excavator's Exterior Noise", Funded by Volvo Construction Equipment Co. Ltd. (2015~2016)
- "Secured Smart Electric Vehicle Specialist Education Team, BK21+", Funded by Ministry of Education & NRF. (2013~2020)

PROFESSOR PROFILES

Professor

Ji Hyun Yang

Laboratory

Humans and Vehicle Automation Lab.

http://huva.kookmin.ac.kr/

EDUCATION

- MIT, Aeronautics & Astronautics, PH.D.
- MIT, Aeronautics & Astronautics, S.M.
- Seoul National University, Mechanical & Aerospace Eng., B.S.
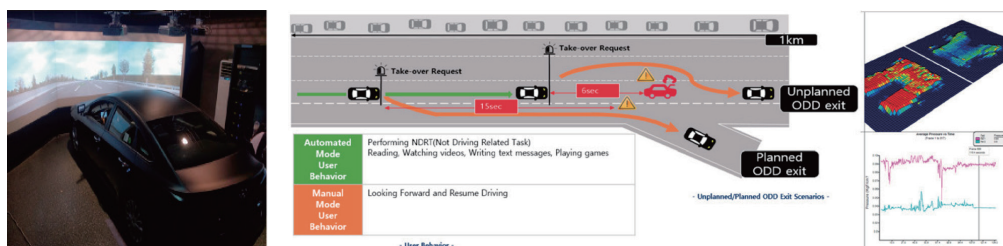
EXPERIENCE

- Associate Professor, Kookmin University. (2016~Present)
- Assistant Professor, Kookmin University. (2013~2016)
- Research Associate Professor, Naval Postgraduate School. (2011~2013)
- National Research Council Fellow & Research Scientist Principal, Naval Postgraduate School. (2008~2011)

RESEARCH AREAS

- Human-Vehicle Interaction.
- Automated Driving HMI. (Human-machine Interaction)
- Active Safety for Ground and Aerial Transportation Systems.
- Operator Cognition Modeling in Manned/Unmanned Systems.
- Fatigue Detection & Analysis.

RECENT R&D ACTIVITIES

- "Development of Evaluation of Automated Driving Systems for Motorway & City Road",Funded by Ministry of Trade, Industry and Energy. (2017~2021)
- "Systematic HMI Method Development for Partially Automated Vehicles for Safe Takeover based on Real and Simulated Vehicles", Funded by National Research Foundation of Korea. (2017~2021)
- "Development of Evaluation Technology of Safety on Control Takeover for Autonomous Vehicle (SAE level 2, 3)", Funded by Ministry of Land, Infrastructure & Transport. (2017~2020)
- "Study on the Trust Threat Factors in the Automated Driving", Funded by Hyundai Motor Co.(2018)
- "Development of R&H Performance Prediction Method Considering Human Factors" Funded by Hyundai Motor Co. (2017~2018)
- "Simulation-based Operability Evaluation Method for Future Combat Vehicles, Funded by Agency for Defense Development. (2013~2018)

PROFESSOR PROFILES

Professor

Jong Chan Kim

Laboratory

Automotive Embedded
Software Lab.

http://avees.kookmin.ac.kr

EDUCATION

· Seoul National University, Computer Science and Eng., Ph.D. (2013)
· Seoul National University, Computer Science and Eng., M.S. (2001)
· Seoul National University, Computer Science, B.S. (1999)

EXPERIENCE

· Associate Professor, Kookmin University. (2016~Present)
· Assistant Professor, Kookmin University. (2014~2016)
· Chief Research Engineer, TmaxSoft. (2002~2008)

RESEARCH AREAS

· Real-time Embedded Systems.
· Cyber-physical Systems.
· Computing Platform and Safety Architecture for Automated Driving Systems.
· AUTOSAR Software Architecture Optimization.
· Multcore Software Architecture Optimization
· ISO26262 Functional Safety Standard.

RESEARCH ACTIVITIES

· Deep Learning-based Perception and Decision for Automated Emergency Steering, Funded by Ministry of Trade, Industry and Energy. (2018.4~2021.12)
· Development of Safety Driving Control Technology for Platooning Trucks, Funded by Ministry of Land, Infrastructure & Transportation. (2018.4~2021.12)
· Resilient Cyber-physical Systems Research Center, Funded by Ministry of Science and ICT.(2017.3~2021.12)
· Model-based Automotive Software Architecture Optimization for Multicore ECUs, Funded by NRF. (2017.3~2020.2)
· Automated Inter-core Shared Resource Protection for Highway Driving Assist System, Funded by Hyundai Mobis. (2016.5~2016.12)
· Semi-automated Migration of Engine Management System from Singlecore to Multicore, Funded by Hyundai Autron. (2015.9~2016.8)

Professor

Sejoon Lim

Laboratory

Intelligent Mobility Lab.

http://lim.kookmin.ac.kr

EDUCATION

- MIT, Electrical Eng. & Computer Science, Ph.D.
- MIT, Electrical Eng. & Computer Science, M.S.
- Seoul National University, Electrical Eng., B.S.

EXPERIENCE

- Kookmin University, Associate Professor. (2019~Present)
- Kookmin University, Assistant Professor. (2015~2019)
- Oracle USA, Senior Member of Technical Staff. (2012~2015)
- Alticast, Software Engineer. (2002~2005)

RESEARCH AREAS

- Artificial Intelligence Application to Autonomous Driving.
- Vehicle & Mobility Big Data Analysis.
- Prediction & Recognition for Driving Environments.
- Intelligent Transportation Systems.

RESEARCH ACTIVITIES

- Model-based AI algorithm and embedded technology for xEV driving performance optimization, Funded by Hyundai NGV. (2023~Present)
- Multi-modal sensor-based emotion/intention recognition algorithm for metaverse environment, Funded by National Research Foundation(NRF). (2022~Present)
- V2X convergence and management technology for real-time traffic safety, Funded by Korea Institute of Police Tech(KIPoT). (2021~Present)
- Machine learning-based performance prediction algorithm for EV, Funded by Hyundai NGV. (2022)
- AI-based E-VMC control for xEV driving performance improvement, Funded by Hyundai NGV. (2022)
- Deep learning-based MDPS position controller optimization, Funded by Hyundai MOBIS. (2021~2022)
- Automatic learning algorithm for improving test efficiency of virtual and robot driver, Funded by Hyundai NGV. (2020~2022)
- Deep learning-based short-term prediction of link transit time, Funded by Hyundai AutoEver. (2021)
- AI computing module for self-driving cars, Funded by Ministry of Trade, Industry and Energy. (2019~2021)

PROFESSOR PROFILES

Professor

Jinwoo Yoo

Laboratory

Intelligent Vehicle Signal Processing Lab.

http://ivsp.kookmin.ac.kr/

EDUCATION
- POSTECH, Electronic Electrical Eng., Ph.D.
- POSTECH, Electronic Electrical Eng., M.S.
- POSTECH, Electronic Electrical Eng., B.S.

EXPERIENCE
- Associate Professor, Kookmin University. (2022~Present)
- Assistant Professor, Kookmin University. (2019~2022)
- Senior Engineer, Samsung Research of Samsung Electronics. (2015~2019)

RESEARCH AREAS
- Signal/Image Processing Technologies for Autonomous Driving.
- Object Detection/Tracking/Prediction based on Deep Learning.
- Simultaneous Localization and Mapping (SLAM).
- Path Planning and Reinforcement Learning.
- Autonomous Driving Technologies based on Real Vehicle & 3D Simulator

RESEARCH ACTIVITIES
- Real Vehicle and Simulator System Safety Evaluation (2021~2027)
- Lidar/Camera Sensor-Cleaning Logic Development for Autonomous Driving (2022~2023)
- Color-Modulated Extra-Sensory Perception Technology Research Center (2021~2028)
- Autonomous Driving Technologies based on Vehicle-in-the-Loop Simulation (2021~2027)
- Advanced Sensor Signal Processing for Autonomous Driving based on Adaptive Filter (2021~2024).

Professor

Seunghoon Woo

Laboratory

Integrated Vehicle
Dynamics & Control Lab.

https://ivdc.kookmin.ac.kr/

EDUCATION

• Seoul National University, Mechanical & Aerospace Eng., PH.D.

• Gwangju Institute of Science and Technology, Mechatronics Eng., M.S.

• Hanyang University Mechanical Eng., B.S.

EXPERIENCE

• Associate Professor, Kookmin University. (2022 ~ Present)

• Senior Engineer, R&D Center, Hyundai Motor Company (2001 ~ 2022)

RESEARCH AREAS

• Development of Individual and Integrated Chassis Control Technology

• Fault-tolerant Vehicle Chassis Cooperative Control Technology

• Digital Twin-based Vehicle Performance Verification Technology

• Vehicle Dynamics-based Autonomous Driving Control Technology

RESEARCH ACTIVITIES

• Steering Backup Redundancy System Logic Design and Verification (2021 ~ 2022)

• Development of The Core System Technology for Hyper-safe Driving Platform (2021 ~ Present)

• Functional Safety Fault Tolerant Time Interval and Safety Mechanism Validation for The Reliability of SBW System (2022 ~ Present)

• Control Logic Enhancement Study for Improving Disturbance Rejection and Steering Performance of EPS Torque Feedback Controllers (2022 ~ Present)

• Technology Development of SW Integrated Terminal Platform for Cargo Transportation Driving Management Based on V2X Hub Technology for Autonomous Vehicles. (2022 ~ Present)

• Development of Safety of The Intended Functionality from Insufficiency of Perception and Decision Making (2022 ~ Present)
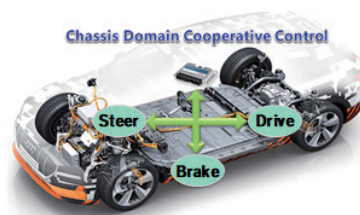
[Integrated Chassis Control]
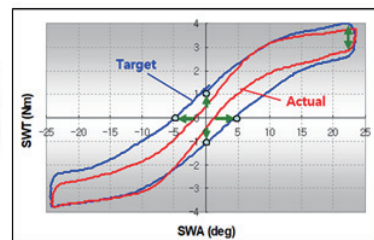
[Individual Chassis Control]
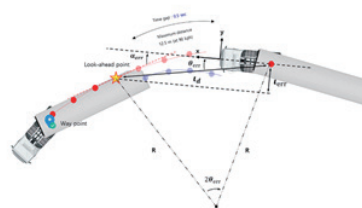
[Autonomous Driving Control]

[Functional Safety Assessment]

PROFESSOR PROFILES

Professor

Sanghoon Jeon

Laboratory

Planning on setting up new lab.

EDUCATION

- Korea University, Cybersecurity, Ph.D.
- Sungkyunkwan University, Software Eng., M.S.
- Korea University, Computer Science, B.S.
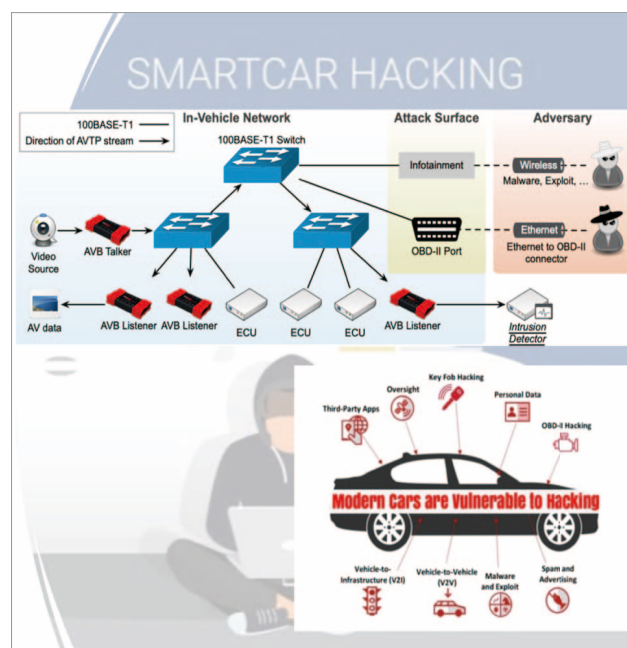
EXPERIENCE

- Assistant Professor, Kookmin University. (2023~Present)
- Senior Researcher, Software Center, Samsung Electronics (2006~2023)

RESEARCH AREAS

- Cybersecurity Technologies for Autonomous Driving
- Data-driven Automotive Threat Hunting
- Automated Vulnerability System for Automotive
- Security Assessment for Automotive (ISO21434, CSMS)

RESEARCH ACTIVITIES

- Automotive Fuzzing Techniques with Deep Learning Model: Attack and Defense, Funded by Samsung Electronics (2020 - 2022)
- Development of Automated Vulnerability Detection System: static and dynamic approach, Funded by KISA (2021 - 2022)
- Development of Security Primitives for Unmanned Vehicles: The Robustness of Federated Learning against backdoor attack, Funded by Samsung Electronics (2022)
- Research on Automotive Cybersecurity based Data-driven approach, Funded by Kookmin University (2023 - present)

PROFESSOR PROFILES

Professor

Suwon Lee

Laboratory

Future Mobility Control Lab.

https://fmcl.kookmin.ac.kr

EDUCATION

- Seoul National University, Mechanical and Aerospace Engineering, Ph.D. (2021)
- Seoul National University, Mechanical and Aerospace Engineering, B.S. (2015)

EXPERIENCE

- Assistant Professor, Department of Future Mobility, Kookmin Univ. (2022~Present)
- Staff Engineer, Mechatronics R&D Center, Samsung Electronics (2021~2022)

RESEARCH AREAS

- Path Planning, Guidance and Control Algorithms
- DNN-based Controllers
- Urban Air Mobility Systems

RESEARCH ACTIVITIES

- Research on Control System Design and Verification Methodology using Deep Learning for Nonlinear Control Systems
- Path Planning, Guidance, and Control Algorithms for Future Mobility
- A Study on Improvement of Launch Acceptability Region for Air-launched Guided Munition
- Development of Wireless Communication Tracking based Location Information System in Disaster Scene for Fire-fighters and Person Who Requested Rescue
- Development of Target Tracking Algorithm
- A Study on Control System Using Strapdown Seeker with Multi-division Field-of-View
- A Study on Trajectory Generation and Imroved Guidance/Control System for Precision Guided Munition

PROFESSOR PROFILES
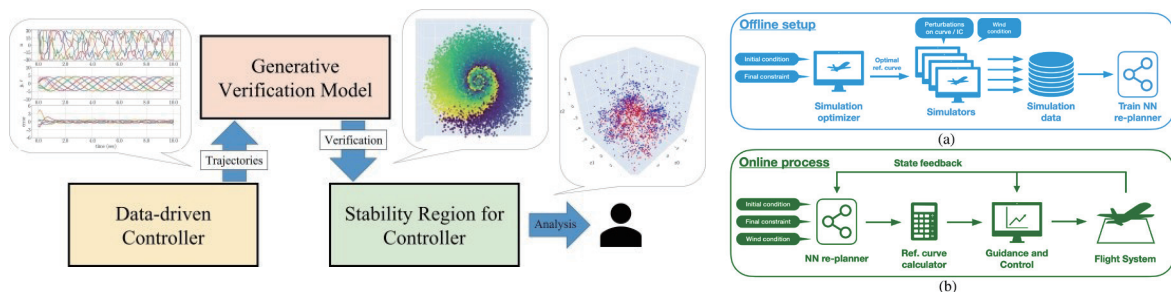
Professor

Kyowon Song

Laboratory

Future Mobility Operation Laboratory.

https://fmo.kookmin.ac.kr/

EDUCATION

- KAIST, Civil and Environmental Engineering, Ph.D.
- KAIST, Civil and Environmental Engineering, M.S.
- University of Seoul, Transportation Engineering, B.S.

EXPERIENCE

- Assistant Professor, Kookmin University. (2022~Present)
- Manager, Korean Air. (2013~2022)

RESEARCH AREAS

- UAM/AAM Traffic Management
- Optimization of Vertiport Location
- Vertiport Traffic Management
- Future Mobility Simulation
- Future Mobility Plan and Operations

RESEARCH ACTIVITIES

- Establishment of UAM operation control procedures based on CNSi system, Funded by Korean Air. (2023~Present)
- Developing real-time optimal scheduling and traffic management technology for UAM operation, Funded by Kookmin University. (2022~Present)
- A study on promoting mobility based on future public transportation, Funded by Ministry of Land, Infrastructure and Transport. (2022~2023)
- A study on analyzing global UAM market trends and developing domestic development and commercialization strategies, Funded by KAI. (2022)
- Research on key application systems for UAM/OPPAV, Funded by Konkuk University. (2022)

<Optimal airspace design for UAM>   <Development of UAM approach control model>
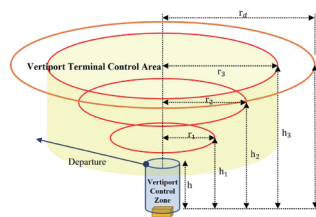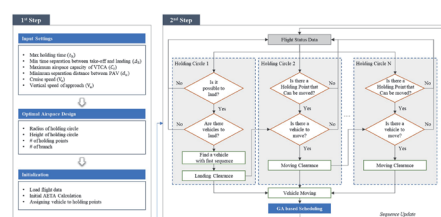
FULL-TIME INSTRUCTOR PROFILES

PROFESSORS SPECIALIZING IN LECTURES

Prof. Sang Beom Lee

MAJOR
Vehicle Structural Analysis & Optimum Design

Prof. Kangjun Lee

MAJOR
Digital Image Processing, Computer Vision

Prof. Dongheon Lee

MAJOR
Mechanism and Design

Prof. Doo Ok Seo

MAJOR
Data Communications and Computer Networks

Prof. Heesun Lim

MAJOR
Electric Motor Control & Inverter Design

PROFESSORS SPECIALIZING IN INDUSTRIAL COLLABORATION

Prof. Hyunsoo Jang

MAJOR
Structural Strength Analysis & Optimal Design

Prof. Keunhaeng Kim

MAJOR
Information Technology Policy Management

Prof. Kyujong Park

MAJOR
Manufacturing Engineering & Manufacturing Operation

Emeritus. Chan Mook Kim

Emeritus. Woon Sung Lee

Emeritus. Young Chool Han

Emeritus. Seung Jin Heo

Emeritus. Yong Seok Cho