



Tsinghua International Summer School on Advanced Automotive Technology

Hybrid Electric Vehicle and Connected Vehicle Technology

July 5 ~ July 13, 2014

Tsinghua University, Beijing, China

Brief Introduction

Founded in 1911, Tsinghua University is one of the most prestigious universities in China, and ranks among the top ten most beautiful campuses in the world. The Department of Automotive Engineering (DAE) is one of the leading organizations in China for educating the young talents, undertaking research, shaping national policy and organizing international program in the automotive field. From July 5th to July 13th, the DAE will open the Tsinghua International Summer School on Advanced Automotive Technology (TISS-AAT) on the themes of hybrid electric vehicle and connected vehicle technology.

Eight courses on different aspects of these two hot areas of automotive technology will be presented by the leading scientists from the China, US and Sweden, and by the authoritative experts in the industry (See page 2 for an overview and page 4~12 for detailed introduction to the courses and lecturers). Visit of the State Key Laboratory of Automotive Safety and Energy allows one to explore the most recent research progress in this leading research lab in China. A number of activities are specially arranged for the oversea students (page 3), including tours of historical sites in Beijing (registered in the lists of UNESCO World Heritage Sites), participation and presentation of research results in the Doctoral Forum of DAE, and communication with the Chinese summer school attendants in an informal meeting.

Eligibility

This summer school is for graduate students majored in engineering and interested in automotive technology.

Costs

The courses are free for the registered students.

Dining card in student cafeteria is provided for free. Deposit of 100 RMB at the registration is needed.

The deposit will be returned at the end of the summer school, in exchange for the dining card.

Sightseeing is selectable and charged a minimum fee (See page 3).

Accommodation needs to be booked and paid by the participants themselves. (See page 13 for the recommended hotels nearby.) Insurance and travel needs to be taken care of by the participants themselves.

Application

Application for oversea students opens on April 21 and closes on June 1, 2014. Please email the application form to thudaesummer2014@gmail.com.

Admission will be notified by email before June 4, 2014.

Registration

Register on B202 of Automotive Building in 14:00~17:00 of July 4, 2014. Please print the e-mail of admission and bring it with you. See the access map on page 13.

For any question, please contact:

Ms. Ye LIN Email: gcxws@tsinghua.edu.cn

Mr. Bin WU Email: thuwubin@gmail.com Phone: 86 15901065349

For more information, please access website:

<http://www.dae.tsinghua.edu.cn/publish/daeen/index.html>



Tsinghua International Summer School on Advanced Automotive Technology
Hybrid Electric Vehicle and Connected Vehicle Technology

Schedule

Courses

	9:00 ~ 12:00	14:00 ~ 17:00
July 7 Monday	Opening ceremony Course 1: Vehicle Electrification and Automotive Powertrain Systems (Prof. Minggao Ouyang)	Course 2: Soft-Run Control Concept and its Application in Hybrid Power System (Prof. Fuyuan Yang)
July 8 Tuesday	Course 3: Applications of Hybrid System Control Methods to Engine Control (Prof. Per Tunestål)	
July 9 Wednesday	Course 4: Coordinative Control of Engine, Electric Drive, and Aftertreatment Systems in Hybrid Electric and Plug-in Hybrid Electric Vehicles (Prof. Junmin Wang)	
July 10 Thursday	Course 5: Connected Vehicle Technology and its Applications on Safety, Mobility, and Environment (Prof. James R. Sayer, Prof. Henry X. Liu)	
July 11 Friday	Course 6: System Engineering Approach to Product Development and Fuel Cell System Design Analysis & Control (Dr. Chendong Huang)	
July 12 Saturday	Course 7: Electrochemical Power Sources in Hybrid Electric Vehicles (Prof. Jianbo Zhang)	Vehicle propulsion electronic system for 2020 (Mr. Patrick Leteinturier, Infineon Technologies AG) Visiting the State Key Laboratory of Automotive Safety and Energy
July 13 Sunday	Course 8: Perspectives of Energy-Efficient Technologies in China's Auto Industry (Prof. Fuquan Zhao) Closing ceremony	



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Schedule

Activities



The Great Wall

09:00~16:30, July 5, Saturday

Price*: 200 RMB

<http://www.badaling.gov.cn/>



The Forbidden City

09:00~16:30, July 6, Sunday

Price*: 200 RMB

<http://www.dpm.org.cn/shtml/2/@/8797.html>



Doctoral Forum

19:00~21:30, July 6, Sunday



The Temple of Heaven

09:00~16:30, July 7, Monday

Price*: 200 RMB

<http://en.tiantanpark.com/default.aspx>



The Chinese and Foreign Students Communication Meeting

19:00~21:00, July 10, Thursday



Visiting the State Key Laboratory of Automotive Safety and Energy

15:00~17:00, July 12, Saturday

* The price includes the transportation and entrance tickets. The three tour activities are selectable based on your preference. Please pay by cash when you come to register on campus.



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Course Abstract & Lecturer Biography

Course 1: Vehicle Electrification and Automotive Powertrain Systems

Abstract

The first part of the lecture will briefly introduce the background, the current status and the prospect for the vehicle electrification, including the trend in the world, the technology path selection and roadmap in China, the analysis of the powertrain system of hybrid electric vehicles (HEV), battery electric vehicles (BEV), and fuel cell electric vehicles (FCEV), the evolution and integration of key technologies in electrification, light weight, smart vehicles, as well the achievements and challenges of the new-energy vehicle (NEV) program in China.

The second part will discuss in detail the theory of powertrain systems, which constitutes the common framework for different types of electric vehicles. The theory consists of three layers at three frequency bands for powertrain systems: the upper layer deals with low-frequency nonlinear model and optimized energy management, the middle layer deals with dynamic model in mid-frequency and model-based algorithm for dynamic coordination, and the lower layer deals with the high-frequency dynamics and real-time driving controls. As an application of the theory, the ICE/motor hybrid powertrain, the battery electric powertrain and the hydrogen fuel cell powertrain, are analyzed. Finally, the effectiveness of the theory is verified in a joint R&D program involving the research team in Tsinghua University, the spin-off venture of our graduates, and big car companies.

Lecturer: Prof. Minggao Ouyang, Tsinghua University



Prof. Minggao Ouyang got his Ph.D. degree in Technical University of Denmark in 1993. He got posts successively as post doctorate, associate professor, professor, and director of Automotive Engineering Department of Tsinghua University. Now he is the Deputy Director of Academic Committee of Tsinghua University, the Director of State Key Laboratory of Automotive Safety and Energy, a Changjiang Scholar Endowed Distinguished Professor of Tsinghua University. He also serves as a member of CPPCC Standing Committee, the Vice Chairman of China Society of Automotive Engineers, an Editorial Board Member of "China Science: Technology Science" and the Chief Editor of "Journal of Automotive Safety and Energy".

Prof. Ouyang has been engaged in the research area of automotive powertrain systems and control technologies for a long time, including electronic-controlled IC engines, Lithium-ion Battery and hydrogen fuel cell engines, hybrid powertrain systems. He has taken charge of and participated in many national and international key technical plans. He was the leader of the experts' group for 11th Five-Year 863 project "Energy-Saving and New Energy Vehicle". Now he is a member of expert committee of 12th Five-Year 863 national high-tech Plan, and leader of expert committee of Key S&T Program of "Electric Vehicle", and the Chief Scientist of China-U.S. Clean Vehicle Consortium (CERC-CVC), the leader author of IPCC AR5 in transport.

He has been responsible for finishing several projects of national 863, National Science and Technology Development, international cooperation and science foundation. Prof. Ouyang has

published more than 60 papers cited by SCI and 150 papers cited by EI, He has won two second-class prizes of National Award for Technological Invention as the first inventor. He also won three prizes of Provincial Science and Technology Progress as the first person for completion, the Ho-Leung-Ho-Lee Science and Technology Innovation and the Technical Achievement Award for International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE).

Course 2: Soft-Run Control Concept and its Application in Hybrid Power System

Abstract

Focusing on the energy optimization control between the different power sources as IC engine & electric motor, fuel cell & battery electric power, this course will introduce a proposed soft-run control method. The contents will consist of:

1. The characteristics of different power sources in a hybrid system;
2. Basic criterion of the coordinate control among the multi-power;
3. Analysis on the energy saving principle of power split systems and in-line full hybrid system;
4. Understanding of the 18 types of hybrid construction;
5. Concept and method of soft-run control;
6. Practice of soft-run control on a fuel cell – battery hybrid bus based on the analysis of vehicle running condition;
7. Close loop control and new concept combustion for hybrid engine.

Lecturer: Prof. Fuyuan Yang, Tsinghua University



Fuyuan Yang is Professor of Tsinghua University and the deputy head of the Department of Automotive Engineering in Education, Vice Executive Secretary of Engine Branch of CSAE (China Society of Automotive Engineers), and member of the council of Beijing Internal Combustion Engine Society.

His major research area is the control of advanced diesel engine & hybrid powertrain system. Since 2000, Professor Yang has been taking charge of over 20 national 863/973/(Science & Technology Support) programs and published 40 papers in core journals, applied for 33 Chinese patents, and awarded a National Technology Invention Award (2007) and a Beijing Science & Technology Progress Award (2010).

Course 3: Applications of Hybrid System Control Methods to Engine Control

Abstract

This lecture covers applications of hybrid system control methods to engine and combustion control. Modern internal combustion engines are complex systems with many time scales (injection, combustion, thermal, road) as well as strong nonlinearities and a mix of continuous time (air path and rotational dynamics) and discrete time (combustion). This complexity has to be handled by the control system in an effective way by careful design of control loops and computational tasks. In addition to this inherent complexity, the need for control is increasing both due to introduction of advanced combustion concepts and due to stricter legislative limits on emissions and fuel consumption. The lecture will introduce a variety of engine control concepts that address these challenges: nonlinear control, optimal control, switching control to mention a few. Some necessary sensor analysis methods will also be covered in the lecture.



Lecturer: Prof. Per Tunestål, Lund University

Prof. Per Tunestål received the M.S. degree in Engineering Physics from Lund University, Sweden in 1993. He received a Ph.D. degree in Mechanical Engineering from the University of California, Berkeley in 2000 and subsequently a Ph.D. degree in Heat and Power Engineering from Lund University in 2001.

Prof. Tunestål started as an assistant professor at Lund University in 2001 and has subsequently worked predominantly with engine combustion control and gas engine research and has conducted numerous research projects, often in collaboration with Swedish and/or international automotive industry. In 2012 he was appointed full professor. His research interests include control, modeling and estimation applied to engine combustion systems.

Special interests are engine control based on in-cylinder measurements and cylinder-pressure based parameter estimation. He is an author / co-author of over 130 peer-reviewed papers in journals and conference proceedings, co-authored eight books and holds 1 world patent.

Prof. Tunestål serves as an Associate Editor for the International Journal of Engine Research and has organized/co-organized numerous sessions at SAE conferences as well as IFAC conferences. He also served as chairman of the SAE Control and Calibration Committee 2008-2010. Since 2009 Prof. Tunestål serves as Director of Doctoral Studies at the Lund University Faculty of Engineering. He has supervised five Ph.D. students to doctoral degrees as main supervisor and additionally 10 Ph.D. students as co-supervisor.

Course 4: Coordinative Control of Engine, Electric Drive, and Aftertreatment Systems in Hybrid Electric and Plug-in Hybrid Electric Vehicles

Abstract

This lecture covers coordinative control of engine, electric drive, and aftertreatment systems for energy consumption and emission reductions in hybrid electric and plug-in hybrid electric vehicles (HEV and PHEV). Recent advances on powertrain technologies such as lean-burn gasoline, advanced diesel, and novel combustion strongly necessitate the optimal coordination among engine, electric drive, and aftertreatment systems for minimizing the energy consumptions and emissions on HEV/PHEVs in real-world operations. The substantially-increased system complexities and challenges require in-depth and effective coordinative control methodologies that are beyond the typical power-split strategies. The lecture will introduce a variety of engine-electric drive-aftertreatment system coordinative control and estimation techniques with emphases being placed on the synergistic combinations of physical system characteristics and control theories.

Lecturer: Prof. Junmin Wang, Ohio State University



Prof. Junmin Wang received the B.E. degree in Automotive Engineering and M.S. degree in Power Machinery and Engineering from the Tsinghua University, Beijing, China in 1997 and 2000, respectively, the second and third M.S. degrees in Electrical Engineering and Mechanical Engineering from the University of Minnesota, Twin Cities in 2003, and the Ph.D. degree in Mechanical Engineering from the University of Texas at Austin in 2007.

Prof. Wang has five years of full-time industrial research experience (May 2003 - August 2008) at Southwest Research Institute (San Antonio, Texas). Since September 2008, he has been the Director of the Vehicle Systems and Control Laboratory (VSCL) in the Department of Mechanical and Aerospace Engineering at The Ohio State University, Columbus, Ohio. His research interests include control, modeling, estimation, and diagnosis of dynamical systems, specifically for engine, powertrain, aftertreatment, hybrid, flexible fuel, alternative / renewable energy, (electric) ground vehicle, intelligent transportation, sustainable mobility, energy storage, human-vehicle interactive, and mechatronic systems. He is an author/co-author of over 170 peer-reviewed papers on journals and conference proceedings and holds 11 U.S. patents. Prof. Wang serves as an Associate Editor for the IEEE Transactions on Vehicular Technology, IFAC Journal Control Engineering Practice, ASME Transactions Journal of Dynamic Systems, Measurement and Control, and SAE International Journal of Engines. Dr. Wang served as the Chair (2010 - 2012) of the SAE International Control and Calibration Committee, and is the Vice Chair (2012 - 2014) of the ASME Automotive and Transportation Systems Technical Committee, member (as the Liaison for IEEE Control Systems Society) of the IEEE Transportation Electrification (Electric Vehicle) Steering Committee, Vice Chair of the IFAC Technical Committee on Mechatronic Systems, and Chassis Control Working Group Chair of the IEEE Technical Committee on Automotive Control. Prof. Wang is a recipient of the National Science Foundation (NSF) CAREER Award, SAE Ralph R. Teetor Educational Award, Ohio State University Lumley Research Award in 2012, the SAE International Vincent Bendix Automotive Electronics Engineering Award in 2011, the Office of Naval Research Young Investigator Program (ONR-YIP) Award in 2009, and the ORAU Ralph E. Powe Junior Faculty Enhancement Award in 2009.

Course 5: Connected Vehicle Technology and its Applications on Safety, Mobility, and Environment

Abstract

This lecture covers the basic knowledge and the latest development of the connected vehicle technology and its applications. In the last few years, connected vehicle technology has emerged as a hot research topic due to its potential to transform the surface transportation systems. With the connected vehicle technology, not only can vehicles communicate with each other, vehicles can also communicate with roadside infrastructure. Such connectivity provides many opportunities to improve transportation safety, mobility, and the environment. This lecture will provide an in-depth coverage on the fundamentals of connected vehicle technology, as well as the state-of-the-art research developments on this topic. In particular, we will highlight the recent development of the Safety Pilot Project and Southeast Michigan Connected and Automated Vehicle Testbed sponsored by the USDOT.

Lecturer: Prof. James R. Sayer, University of Michigan



Prof. James R. Sayer received the B.S. degree in Psychology from the University of Michigan in 1988, the M.S. degree in Industrial and Systems Engineering from Virginia Tech in 1991, and the Ph.D. degree in Industrial and Systems Engineering from Virginia Tech in 1993.

Dr. Sayer conducts both basic and translational research in the areas of advanced vehicle safety systems, naturalistic driving behavior, driver distraction, driver vision, and pedestrian conspicuity. His research findings are utilized by vehicle manufacturers and suppliers in support of the design, development, and deployment of safety technologies, as well as by government agencies in establishing policies and regulations related to vehicle safety technologies and driver behavior. Dr. Sayer's

research has led to, or supported, the development of both national and international standards for motor vehicle advanced safety systems engineering and pedestrian conspicuity. He is an internationally recognized leader in the conduct and evaluation of field operational tests of motor vehicle safety systems and the study of naturalistic driving behavior. Dr. Sayer currently serves as the Program Manager for the U.S.DOT's Connected Vehicle Safety Pilot Model Deployment program and Head of the Human Factors Group.

Dr. Sayer is a member of Human Factors and Ergonomics Society, Surface Transportation Technical Group, International Standards Organization (ISO), Transportation Research Board, and Vehicle User Characteristics and Visibility Committees.

Dr. Sayer is a recipient of the Intelligent Transportation Society of America, 2008 Best of ITS, Best Innovative Product or Service, Integrated Vehicle-Based Safety System program in 2008, the Society of Automotive Engineers Excellence in Oral Presentation Award at SAE 2012 Government/Industry Meeting, and the Intelligent Transportation Society of America, 2013 Best of ITS Finalist, Advanced Innovative Technology Solutions, Safety Pilot Model Deployment program.

Lecturer: Prof. Henry X. Liu, University of Michigan

Prof. Henry X. Liu received the B.E. degree in Automotive Engineering and M.S. degree in Automotive Engineering from the Tsinghua University, Beijing, China in 1993 and 1997, and the Ph.D. degree in Civil and Environmental Engineering (Minor in Computer Science) from University of Wisconsin at Madison in 2000.

Dr. Liu has four years of industrial research experience at Co-founder and Chairman of Advisory Board in SMART Signal Technologies, Inc. from 2011 till now. He has been appointed as a professor (with tenure) by University of Michigan, Ann Arbor since September 2014. His

researches focus on dynamic modeling and simulation of traffic system, including traffic flow theory and network traffic assignment, traffic control system design and optimization, and Cyber-physical transportation systems, including eco-driving and vehicle powertrain management.

Prof. Liu is the editorial board member of Transportation Research Part B, Journal of Intelligent Transportation Systems, and IET Intelligent Transportation Systems. Dr. Liu serves as an Associate Editor for Network and Spatial Economics and Transportmetrica Part B.

Dr. Liu is a recipient of the Research Partnership Award, Center for Transportation Studies, University of Minnesota in 2009, the New Faculty Member Award, Council of University Transportation Centers (CUTC) in 2008, and the Young Engineer of the Year, IEEE Twin Cities Section in 2007.

Course 6: System Engineering Approach to Product Development and Fuel Cell System Design Analysis & Control**Abstract**

This lecture covers two topics. The first topic is to apply system engineering methodology to product development. For a complex system, such as airplane, automobile, traditional product development method cannot meet the timing, quality and cost requirements. System engineering methodology has been applied for Boeing 777 and a lot of major product developments. It helps to reduce development time, cost and improve product quality. The second topic is to apply system engineering methodology to develop Fuel Cell System. The lecture will go through Fuel Cell System principle, current status, design & development process and how to manage a typical fuel cell system. Fuel cell system control, water management, air and hydrogen management and typical failure mode are also covered.

Lecturer: Dr. Chendong Huang, SAIC Motor Corporation

Dr. Chendong Huang received Ph.D. from the University of Michigan, USA. After graduated, he joined in AMPs, Inc. (a Lockheed Martin subsidiary) as Senior Engineer and involved in NASA Ice & Fire program. Later on, he joined in Ford Motor Company. He started as project Engineer, then promoted to Technical Expert and Department Manager. He has led Ford Fuel cell vehicle development from 2000 till 2008. In 2008 he joined in SAIC Motor Corporation as Director of Fuel Cell Vehicle and Program Management. He has led SAIC Fuel Cell Vehicle and Fuel Cell Bus program including 2010 Shanghai Expo program. In 2010, he was promoted to Deputy General Manager, New Energy Vehicle Division of SAIC Motor. He has received several awards from Ford Motor Company. He was the owner of several US patents and published many journal articles. He received SAIC Motor's President award in 2009 and Shanghai Mayor Expo Achievement Award in 2010. In 2011, he was award Shanghai Thousands Returnee Plan. Since 2011, he has led National Innovation Engineering Program on Fuel Cell Vehicle Development. He is also leading 2014-2106 MOST's Fuel Cell Technology Development program.

Course 7: Electrochemical Power Sources in Hybrid Electric Vehicles**Abstract**

Electrochemical power sources, like NiMH battery, LIB, and super-capacitor, etc., are essential devices used in hybrid electric vehicles (HEV). This 3-hour tutorial will first introduce the basic principle of and the requirement of HEV on these electrochemical power sources. It then discusses the major aspects that need to be considered in the choice of these devices when developing HEVs. Finally, the design, test, and management of these devices will be elaborated.

Lecturer: Prof. Jianbo Zhang, Tsinghua University

Dr. Jianbo Zhang is doing research on electrochemical power sources for automotive application. For lithium-ion battery, the research interests range from the thermal characteristics and thermal design of large format lithium ion battery, fast charging technique at low temperature, to performance degradation phenomenon and mechanism, life prediction, and to battery state estimation including SOC, SOF, SOH etc. For the PEM fuel cell, the research includes the fabrication/characterization/modeling and optimization of the structure, property, and performance of the membrane-electrode-assembly (MEA). Currently, the idea of graded and ordered MEA is being actively pursued.

Dr. Zhang had 11 years of research experience in Nissan Research Center before he returned to China and found a position in Tsinghua.

Course 8: Perspectives of Energy-Efficient Technologies in China's Auto Industry

Abstract

The scale of China's auto industry has been firmly held the first in the world; its volume reached 22 million in 2013 and further growth is predictable as well. While, the constraints to China's auto industry are becoming more obvious, among them the energy issue is an especially challenging one to the whole industry. This leads to a stricter CAFC regulation in China--its standard of 5.0L/100km in 2020 is quite hard to be fulfilled. Besides, the consumers are paying increasing attention to fuel consumption. The energy-efficient technologies would thus be one of the core competences for enterprises. Therefore, the maturity, potential and prospect of technologies, the law-conformance and the consumer-cognition will be discussed in detail, including the traditional powertrain, electrification vehicles and hybrid technologies.

The function, importance, methods and processes of modern automotive styling design and its trend in the future will be introduced here, based on the professor's extensive experiences in automobile industry both in China and overseas for many years. Especially some personal precious views from a practical perspective will be shared, including the general guides on how to judge and evaluate the automotive styling, the dialectical relationship between the chief engineers and stylists of a car, and the future and potentials of China automotive styling design will also be discussed.

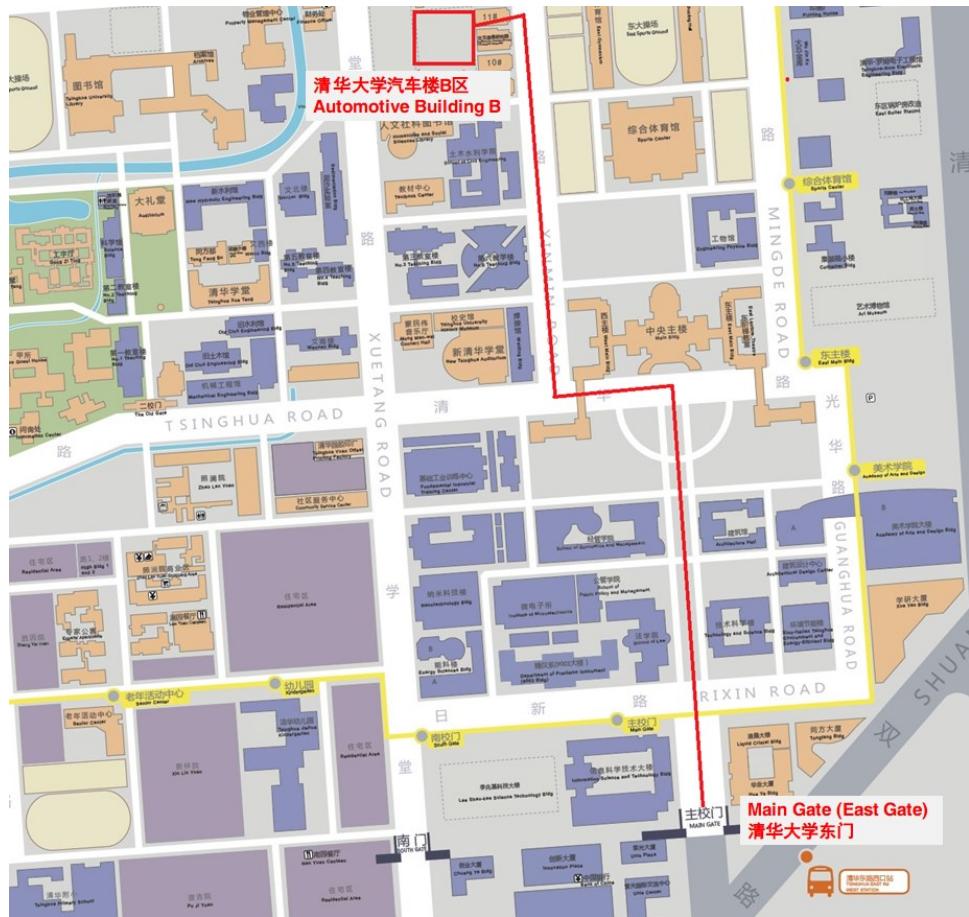
Lecturer: Prof. Fuquan Zhao, Tsinghua University



Dr. Fuquan (Frank) Zhao is a Professor and Director of Automotive Strategy Research Institute at Tsinghua University, China, since May 2013 where he is leading a group of strategic research on automotive industry and technology roadmaps.

Dr. Zhao got a doctorate degree in Engineering from Hiroshima University in Japan in 1992 and has years of on-the-job working experience in Japan, United Kingdom, United States, and China. Prior to joining Tsinghua University, Dr. Zhao had the experience of Vice President of Zhejiang Geely Holding Group, President of Zhejiang Geely Automotive R&D Center, President of Zhejiang Automotive Engineering Institute, and Chairman of DSI company of Australia since November 2006; Vice President of Shenyang Brilliance JinBei Automobile Company Limited and General Manager of its R&D Centre since 2004; and Engineering Specialist and Research Executive of Technical Affairs at DaimlerChrysler since 1997. At DaimlerChrysler, Dr. Zhao was responsible for providing technical guidance and advice to product team managers and engineers within the corporation, relating to engine development issues and advance Powertrain technologies. He represented the Chrysler Group in various consortium activities. Dr. Zhao led the development of nearly 20 passenger cars, SUVs and more than 10 powertrains at Brilliance and Geely since his return to China in 2004. Also, Dr. Zhao had extensive experience in international acquisitions and overseas operations, including Geely's acquisition of British Manganese Bronze Holdings, Australian DSI Holdings, and Volvo Car Corporation. In addition, he was also heavily engaged in the strategic collaboration with these companies. Dr. Zhao has published five books and more than 300 technical papers in English, Japanese and Chinese, and owned more than 100 patents. Dr. Zhao received many reorganizations in his career including but not limited to Fellow of SAE in 2006, China Automobile Industry

Outstanding Person in 2008, CTO of the Year in 2008 and Executive of the Year for Product Planning in 2009 by China Automotive News, the Silver Medal of National Scientific and Technological Progress in 2009, the Gold Medal of China Automotive Science and Technology Progress in 2012, and the Gold Medal of China Enterprise Management in 2012.



For the campus map, please click

<http://www.tsinghua.edu.cn/publish/th/campus/img/map.jpg>

Recommended accommodation

1. Xijiao Hotel 西郊宾馆
Wangzhuang Road No.18, Haidian District, Beijing 北京市海淀区王庄路 18 号
Order line: 8610 6232 2288-5606 Website: <http://www.xijiao-hotel.com.cn/en/index.html>
2. Wenjin Hotel 文津国际酒店
South Gate of Tsinghua University, Chengfu Road, Haidian District, Beijing
北京市海淀区成府路清华大学南门
Order line: 8610 6252 5566 Website: <http://www.wenjin.com.cn/en/index.html>
3. Runze Jiaye Hotel 润泽嘉业大酒店
Heqing Road No.3, Haidian District, Beijing 北京市海淀区荷清路 1 号
Order line: 8610 6252 0066
4. Beijing Qinghuayuan Hotel 北京清华园宾馆
Chengfu Road No.45-1, Haidian District, Beijing 北京市海淀区成府路 45-1 号
Order line: 8610 6257 3355 Website: <http://www.tsinghuahotel.com/en/>