2010 SAE Detroit Visiting

DAY	Date	Schedule			
		AM	PM	PM(17:00-21:00)	Location
1	4/10(Sat.)	Taipei (09:30)	Detroit (13:50)	Free	Taoyuan Detroit
2	4/11(Sun.)	國建會活動			Novi
3	4/12(Mon.)	FORD (9:00~13:00) Research & Innovation Center	Ricardo (14:00~17:00) Battery test lab	Free(TBD)	Dearborn Township
4	4/13(Tue.)	2010 World Congress		Free(TBD)	Cobo Hall Arburn Hill
5	4/14(Wed.)	SAE/MCAPA Tech Seminar @ Altair (3:15~3:45pm SAE H/Q visiting)		Taiwan Night	Troy Novi
6	4/15(Thu.)	2009 World Congress	AVL Powertrain developing	Free(TBD)	Cobo Hall Plymouth
7	4/16(Fri.)	University of Michigan Automotive Technology Workshop (09:00~12:30)	A&D battery(TBC) (14:30~17:00)	Free(TBD)	Dearborn Ann Arbor
8	4/17(Sat.)	觀光行程(Henry Ford博物館、綠野村 Greenfield Village)			Dearborn
9	4/18(Sun.)	Detroit Airport (15:25)			Detroit
10	4/19(Mon.)	Taoyuan Airport (21:45)			Taoyuan

附件一

Ricardo Inc.

Battery Systems Development Center

http://ricardo.com/en-gb/Engineering-Consulting/Automotive-Expertise/Hybrids--EV-Systems/Battery-system-Development-Center/

Ricardo's breadth of expertise ensures true vehicle optimization and real world benefits. An unsurpassed combination of battery development capability and engineering expertise provides an extension of your in-house battery pack development as well as complete, outsourced battery pack designs.
We focus on safe development of Li-ion and NiMH battery packs. BSDC contribution to battery pack development process:

Capabilities

- Up to: 250kW, 1000A, 900V
- Module or full pack testing
- Temperatures up to +60C
- Li-ion, NiMH, Lead-Acid and other rechargeable chemistries
- Hardware in the Loop (HIL) System
- 12 ft. x 12 ft. test chamber to accommodate large packs
- Liquid or air cooled battery packs
- High voltage instrumentation

Applications

- HEV, PHEV, EV
- Passenger Cars
- Heavy Duty Vehicles
- Military Vehicles (ITAR controls in place)
- Stationary and Niche Applications
- On-road or Off-road

Thermal Evaluation

- Evaluate air flow and structure location
- Optimize fan size and location
- Minimize thermocouple count through smart sensor location
- Integrate thermal control system with the rest of the vehicle
- Evaluate cell to cell temperature variation

Battery Management System Development

- State of charge/state of health algorithms
- Cell balancing and instrumentation
- Pack and vehicle communications
- Functional testing and failure response

Vehicle System Optimization

- TVFE (TotalVehicleFuel Economy.com)
- Operation of battery with a simulated vehicle
- Optimization of system operating strategy

Global Battery System Capabilities

A Highly Multi-Disciplinary Process - Ricardo has the necessary team in-house:

Battery Pack Design and Vehicle Integration

- Structural - optimization of existing design or clean sheet design to drawing release for manufacture
- Thermal - analysis of existing design (thermal imaging and/or CAE), suggestions for improvement
- Electrical - sensor selection, safety system design, high voltage electrical component selection and design
- Controls - SOC algorithm development, BMS design and development, vehicle control strategy
- Manufacture - material selection and cost reduction, production supplier identification
- Integration - vehicle packaging, conditioning of cooling air, vehicle performance/fuel economy optimization

Electronics and Battery Management Systems Design

- Concept definition and specification development
- Electronic circuit board design and development
- State of charge/state of health algorithms
- Battery control functions
- Failure mode effects analysis and hazard analysis
- Diagnostics and prognostics development
- Hardware in the loop development including simulated failure response assessment

AVL Powertain Engineering Inc.

http://www.avl.com/wo/webobsession.servlet.go/encoded/YXBwPWJjbXMmcGFnZT12aWV3JiZub2RlaWQ9NDAwMDEzNDIw.html

Background:

Established in 1994 to allow AVL to serve its North American clients directly, AVL PEI with a staff of over 240 personnel has Technical Centers on the west side of the Metro Detroit area in Plymouth and Ann Arbor. Located at the Technical Centers are a total of 21 test sites for engine/transmission/powertrain development and testing.

Experience:

AVL is the leading powertrain design and development consultancy in North America today. We are unique in having the experience, people, technology and facilities to undertake any project from initial feasibility studies to complete turnkey engine programs having been the chosen partner for 8, 2007 – 2010 model year production engine programs.

The extensive range of powertrain engineering capabilities includes:

- Design and Mechanical Analysis for applications from lawn and garden to power generation Thermodynamic and Fluid Dynamics Analysis
- Engine and Vehicle Simulation using both AVL specific and proprietary simulation tools
- Driveability development using AVL-DRIVETM
- Combustion Development leveraging over 60 years of combustion heritage with diesel, gasoline (MPFI and DI) and alternative fules such as Hydrogen and Ethanol

- Performance and Emissions Development for automotive, on and off highway applications
- Aftertreatment simulation and development
- Engine, transmission, powertrain and vehicle level calibration/optimization
- Mechanical Development and Validation
- Controls and Electronic Systems
- Hybrid Powertrain Development for automotive and commercial vehicle applications, from target definition to integration to controls and calibration
- Testing services from research to development to validation testing
- Product optimization in terms of cost, fuel economy, performance and weight
- Warranty management through extensive use of cross functional technical specialists and proven methods and tools
- Reliability management ansd system robustness
- Large engine testing and development up to 10 MW
- Our customers include local and global Automotive and Engine OEM's, local and international component/system suppliers in the conventional and hybrid powertrain field.

A&D Technology Inc. http://www.aanddtech.com/

A&D Technology is a leading global supplier of advanced test and simulation solutions for powertrain testing and vehicle development. Our open, flexible and cost-effective tools are designed to fit a wide variety of applications, from durability and performance to hardware-in-the-loop (HiL) simulation and hybrid/electric vehicle and battery test systems. Our complete range of products includes data acquisition and control systems, combustion analysis and engine indicating systems, dynamometers and torque sensors, as well as real-time simulation systems and model-based automated calibration tools. Through this product offering, combined with best-in-class partners and experienced people, A&D delivers ideal testing environments that not only reduce testing time and increase test coverage, but also realize new methods and tools to effectively manage today's - and tomorrow's complex test requirements.

- Real-time Measurement, Simulation and Control
- Combustion Analysis
- Data Acquisition & Control
- Dynamometers
- Model-Based Development
- Lab Management
- Noise and Vibration
- High Fidelity Torque & Force Measurement

Whether your needs include an automated high-performance dynamic test cell, or a reliable, low-cost cell for durability testing, we have the experience and expertise necessary to get your powertrain testing application up and running more quickly and at less cost.

Battery Development and Testing

Overview

As concerns for the environmental, economic and political impact of conventional motor fuels grow, there has been increasing focus on the electrification of the transportation industry. Dramatic growth in the adoption and usage of hybrid electric vehicle technology will be seen over the next ten years, both in the United States and worldwide. Advanced batteries are the key technology enablers for the future of vehicle electrification. Though continuous improvement of the powertrain is underway, the main hurdle to widespread acceptance of electric vehicles is the price, performance and durability of the batteries.

Challenges

With batteries, manufacturing costs and lifespan are the major issues. Battery life or aging performance is affected by use and calendar time. Use at the extremes of charge is especially detrimental, which is in conflict with good overall range and performance of the vehicle.

Understanding the challenges facing today's battery testing facilities is essential in developing effective tools and control strategies. With the wide range of test equipment in use, communication between devices is difficult, creating a huge need for an integrated systems. Current solutions, because they are generally quite new, require sophisticated technicians to both run tests and define new ones. The test results are then potentially generated in a different format for each piece of test equipment, and data crunching of raw numbers may be required to fully understand the test results. Above all, safety is a major concern, and test facilities require manned operation in case of faults that required manual shut-down of the test.

The A&D Solution

A&D Technology can provide a complete turnkey solution for both EV and HEV testing applications, including design, project management, installation, commissioning, and service plans. Our open and flexible systems, complete with data acquisition and control, lab management and distributed I/O, include proven drivers that are compatible with best-in-class third-party testing components, such as power process systems, air coolant systems, battery ECUs and environmental chambers.

iTest EV - A high-quality flexible system for hybrid vehicles

Based on iTest, A&D Technology's proven data acquisition and control system, iTestEV is a high-quality, flexible tool for full test cell and/or lab coordination. including thermal chambers, power process systems and conditioning units. It also provides complete control and communication with battery control modules and lab safety systems.

iTestEV Components

- Data management - iCentral
    - Test cell monitoring
    - Web access
    - Security
    - Query/Search
- Lab Management - iCentral

- Lab Safety - LabMinder
- System architecture
- Battery-specific data acquisition and control
- Cycler (power supply_ test channel control (high and low power)
- Graphical User Interface
- Test Manager Development Tool
- Reporting
- Auxiliary Equipment (optional)
    - Cycler (power supply)
    - Thermal chamber
    - Coolant/Conditioning Unit
    - Vibration Table

Simulation can also play an important role in EV development. A&D's range of simulations platforms, including the world's most powerful HiL platform, Procyon, can be applied either stand-alone or as part of a complete RPT/HiL or traditional test system.

iTestEV Features

- Drag-and-drop block test sequencing allows for easy test procedure creation and modification
- Open to best-in-class devices
- Remote access and control capability with Lab Minder
- Live test parameter adjustment capability
- Manual and automatic test modes
- Lab overview with iCentral of all channels, including utilization rates
- Includes a suite of standard tests
    - Performance
    - Mechanical Abuse
    - Thermal Abuse
    - Electrical Abuse
- Centralized I/O and power rack for each energy storage device set
- Wide variety of proven drivers available

密西根國建會 熱迎SAE參訪團

記者馮紀漪密西根州報導

April 20, 2010 12:02 AM | 42 觀看次數 | 1 | | |

密西根國建會舉辦台灣之夜，歡迎台灣SAE代表團，前排左起爲王振福、孫立德、吳東權、張哲源、申佩璜、張振東、蘇評揮、顏世榮、張正義、羅時佶，後排右三爲陳豐裕。 記者馮紀漪／攝影

密西根國建會日前在諾娃市喜來登旅館大廳舉辦「台灣之夜」，歡迎台灣零組件S代表團抵底特律參展及訪問。

台灣零組件代表團由台灣SAE理事長張哲領隊，工業技術研究所所長吳東權任副團長，一行還包括經濟部技術處技術顧問蘇評揮、自動機械工程學會副祕書長林照恭、台灣超冷科技公司董事長孫立德等產企業界主管26人。

當晚由國建會理事傅蓓蒂主持，會長顏世榮致歡迎詞，他並重申該會是資訊站，也是台灣及密西根的橋梁，很高興能見到台灣許多優秀產品此次能夠參展，他也簡報了另一場活動科技研習會的舉辦情形。

赴底城參加台灣之夜活動的駐芝加哥台北經濟文化辦事處處長申佩璜致詞時表示，馬英總統指示的「經貿外交」及「活路外交」，即是要外交部與駐外單位協助台商全球部署振興出口貿易，期勉大家攜手打拚，共創經濟雙贏，而以「台灣爲主、與民有利」之理念，循序漸進，規畫與大陸之經貿及各項交流。

他也提到爲台灣融入亞太地區自由貿易體系做準備，馬政府目前正就「兩岸經濟合作架協議」進行談判，若順利簽成，海外台商亦將受益。

他也感謝國建會年年爲台灣代表團安排與地方公司接軌。和申佩璜一同到底城的，還包經文處政治組組長陳豐裕、商務組組長王振福。

張哲源則致詞感謝經文處及密西根國建會精心規畫的參訪行程及研討會，讓團員受益匪淺，他並代表該團致贈紀念牌給申佩璜及顏世榮。

該團到底特律主要是出席國際SAE年會及零組件大展，並在國建會安排下，參觀福特汽公司研發中心、A&D電池公司、AVL零組件公司。

當晚出席的還包括僑務顧問張正義、孔慶超及傅曼玲，以及國建會歷屆會長羅時佶、王揚、周啓峰、王景立、曾喬榮、張隆章等人，在會上熱烈交流。

更多新聞

密西根國建會 理財講座HOT | Mar 02, 2009

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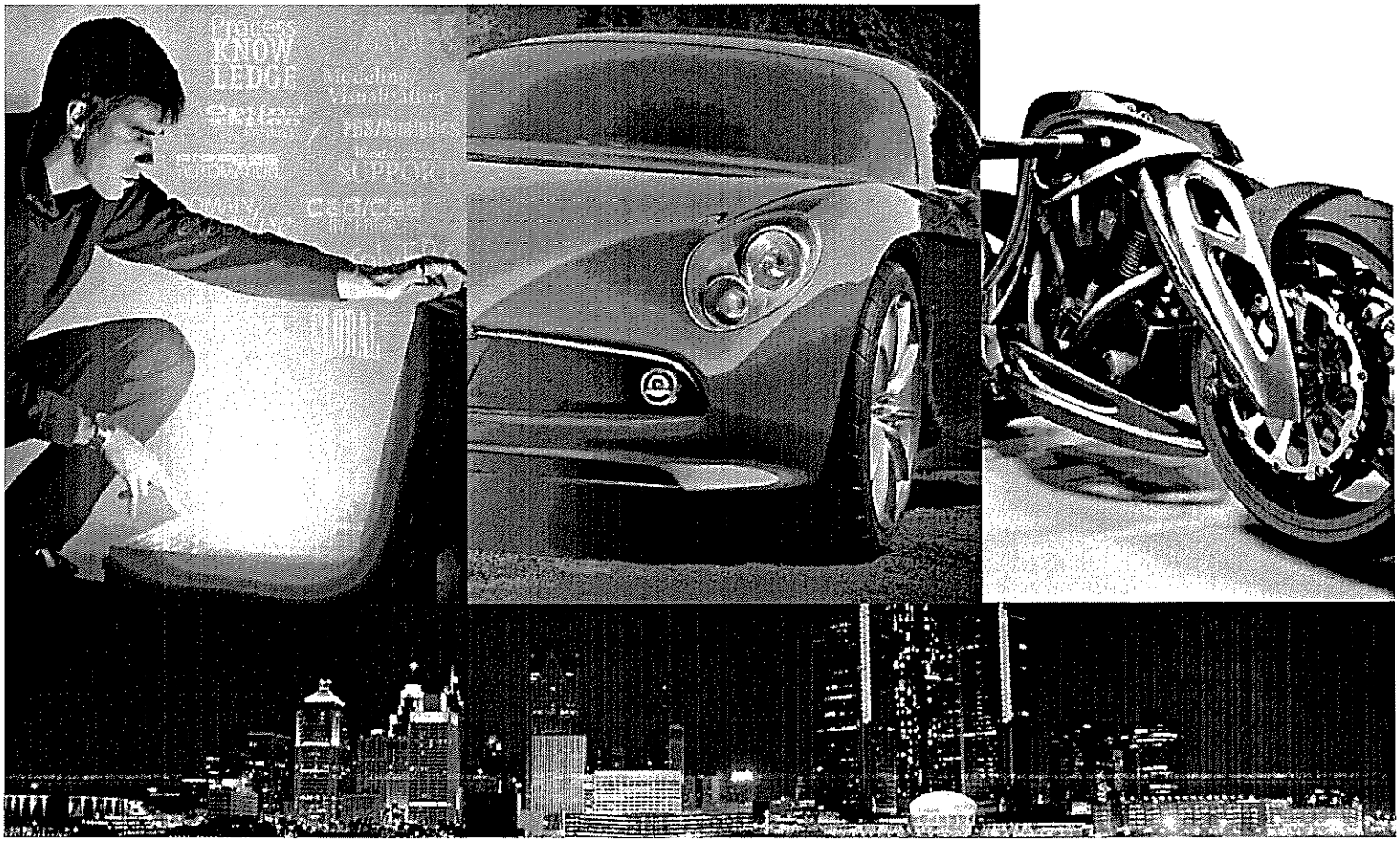
SAE International™

2010 North America Automotive Component Market & Technology Conference

二零一零年北美車輛、零組件市場與技術研討會



April 14, 2010
Troy, Michigan

「全球SAE年會暨「二〇一〇年北美汽車零組件市場及技術」研討會」紀念

促進經貿 敦睦邦誼

僑務委員會
委員長 吳英毅 敬題

駐美國台北經濟文化代表處
Taipei Economic and Cultural Representative Office
in the United States
4201 Wisconsin Avenue, N.W. Washington D.C. 20016
Tel: (202)895-1800

密西根國建學術聯誼會顏會長暨全體會員惠鑒：

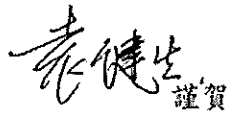
三月三十日華翰敬悉。欣聞本(2010)年美國汽車工程師協會(Society of Automotive Engineers, SAE)全球會議將於四月十三日至四月十五日於底特律舉行，貴會將接待台灣代表團，並在特洛伊市舉辦第20屆『北美汽車零組件技術研討會』。

貴會本次邀請台美兩地汽車專業人士，並舉辦研討會等一系列活動，對加強台美汽車專業技術交流，增進我國汽車工業發展，必有相當助益。承貴會邀請本人出席，惟本人因另有公務不克前來，特函申賀，並祝會務順遂，研討會圓滿成功。

耑此 順頌

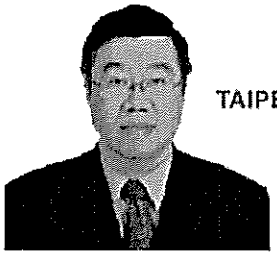
時祺

駐美國台北經濟文化代表處代表



謹賀

中華民國九十九年四月一日



駐芝加哥台北經濟文化辦事處
TAIPEI ECONOMIC & CULTURAL OFFICE IN CHICAGO
TWO PRUDENTIAL PLAZA, 57th FL
180 N. STETSON AVENUE, CHICAGO, IL 60601
TEL: (312) 616-0100 • FAX: (312) 616-1486

台美商機先鋒
經貿外交典範

密西根州國建學術聯誼會
中華民國自動機工程協會 聯合研討會

中華民國九十九年四月十四日

處長 申佩璜 敬題

密西根國建學術聯誼會

Michigan Chinese Academic and Professional Association

各位先進:

國建會非常歡迎各位到底特律來參加 2010 年北美汽車零組件市場及技術研討會.
今年密州的汽車工業在全球經濟回溫下, 已有往上回升的跡象, 讓我們感到在驚濤駭浪中漸瞻曙光. 我們相信汽車工業在不久的將來必能回到已往的高峰, 但是全球市場開發與技術研究的重點卻與以往有顯著的不同, 我們相信其中的改變,就是提供台灣汽車業及零組件產業,另一個邁向成功的轉機.

這些年來, 國建會一直在為台灣的汽車工業發展, 做全方位聯繫的橋樑,並與當地學者專家一起為台灣汽車界的未來提供出一個參與貢獻的平台. 因應油價上漲的趨勢以及汽車市場的走向, 油電混合動力及電動車輛變成了熱門的主題. 過去的幾年,我們安排了許多有關這方面的講題,包括: 未來的動力系統, 替代燃料, 高效率馬達的設計, 電池發展的趨勢, 混合動力車的熱能與溫度調控. 今年參照往年回饋的意見和經過與台灣 SAE 討論的結果, 我們擴展了講題的範圍,增加了汽車主動安全設計,衝撞安全系統,雙離合器變速箱,和較具有策略性的主題,例如:永續性的設計,與產品可靠性評價的重要性來進行探討.

我們很高興能請到此地知名的專家為我們解說未來發展的方向. 希望能給大家提供一些前瞻又實用的觀念, 對各位將來的工作與事業有所助益. 在此我們特別對於接受邀請, 分享研發成果的專家朋友們, 深致謝忱. 在極短的時間當中他們擔待時限之迫, 忍耐催稿之煩, 蒐集資料, 整理成果, 推敲講稿; 實非易事. 相信他們努力的成果能讓各位不虛此行, 滿載而歸.

辦理這樣規模的活動, 實非個人能力所及. 我們很慶幸有前任會長們提供經驗, 悉心指引, 全程護航. 還有國建會理事們與台灣 SAE 的夥伴集思廣議, 盡心盡力. 各位同仁在籌備過程中所表現的計劃執行能力令人欽佩. 我們也深深感謝他們敬業的執著與奉獻.

另外, 本人也要特別感謝服務二十年的 Altair Engineering 公司 一直對我們的技術研討會全力的支持, 提供場地, 並安排會議各項所需事宜.

最後我們要謝謝參與研討會的朋友們, 多謝你們的支持與鼓勵. 希望各位有機會交流新技術, 廣結新朋友, 讓這次座談會圓滿成功.

密西根國建學術聯誼會會長　顏世榮　敬上

2010 年 4 月 14 日

SAE International Taipei Section
中華民國自動機工程學會

密西根國際學術聯誼會

2010 North America Automotive Component Market & Technology Conference

二零一零年北美車輛、零組件市場與技術研討會

April 14, 2010, Wednesday
Altair Engineering, Inc., Troy, Michigan, U.S.A.

08:30 - 09:00 AM	Registration		
09:00 - 09:10 AM	Opening and Welcome Remarks	Mr. Richard Yen	顏世榮 會長
09:10 - 09:15 AM	Greetings	SAE Taipei Section	張哲源 團長
09:15 - 09:20 AM	Introduction	Dr. David Chang	張振東 博士
09:20 -10:20 AM	Sustainable from the Start	Mr. Richard Yen	顏世榮 先生
10:20 -10:30 AM	Break		
10:30 - 11:30 AM	Electric Vehicle & Electromagnetic Effects	Dr. Andy Tong	童坤華 博士
11:30 - 12:00 PM	Altair Company Tour		
12:00 - 01:00 PM	Lunch Break		
01:00 - 02:00 PM	An Introduction to the US Automotive Crash Safety	Dr. Kevin Wang	王惠章 博士
02:00 - 03:00 PM	Vehicle Active Safety—Present & Future	Dr. William Lin	林勤緯 博士
03:00 - 03:15 PM	Break		
03:15 - 04:15 PM	Dual Clutch Layshaft Transmission	Dr. Calvin Lee	李春亮 博士
04:15 - 05:15 PM	How to Develop Electrical/Electronics Module Validation Plan	Mr. Julius Wang	王政 先生
05:15 - 05:30 PM	Discussion/Question & Answer	Dr. David Chang	張振東 博士

Sustainable from the Start 永續發展與創新

Mr. Richard Yen　　顏世榮 先生

Abstract

The common approach to environmental design is to follow design concepts with life cycle assessments as a forensic study. By applying methods analogous to our optimization-driven approach to structural design, sustainability can be designed in, rather than developed out. Decisions on materials, manufacturing processes, use, and disposal or re-use can be made at the design concept stage, when the product life cycle can be considered as a whole rather than as distinct phases

Environmental impacts can vary due to several factors, including process efficiency, regional considerations, and raw material source uncertainty. By acknowledging this variability, design decisions can be made to control the factors driving the uncertainty or to assure that impacts within the variable range are minimized. Improvements can be made in reducing environmental impacts by controlling variability in addition to positive changes in design of a product.

The Altair ProductDesign methodology for impact reduction involves creation of a robust bill-of-processes, cross-referencing the associated impact scores of each process. By evaluating the data in various cross-sections, trends in each impact category can be identified by phase, subsystem, or other data slice to determine where the greatest improvement in impact reduction may occur. The sources of greatest variability in the impacts can be studied for better control of the contributing factors.

Biography

Mr. Richard S. Yen is the Executive Director at Altair ProductDesign, Inc. He is currently responsible for managing and developing the engineering consulting business in the Asia Pacific including Japan, Korea, China, and Taiwan.

Joining Altair in 1989 as a project engineer, he focused on simulation driven design practices. In Altair's first global expansion attempt, he was designated as a pioneer to explore new business opportunities in Japan. From 1992 to 1995, he worked in Japan to expand Altair's global market shares and earned the recognition of Altair from major Japanese manufacturers. He returned to the U.S. in late 1995 to take the role of Product Manager of HyperMesh. More recently, he acted as the Director of Modeling and Visualization and Industry Solutions to manage and integrate Altair's flagship products - HyperMesh, HyperView and HyperGraph. During his 21 year career, he actively participated in global business development, assessed customer feedback, analyzed the trend of CAD/CAE integration to develop product vision, and successfully delivered the best in class, high performance CAE simulation pre- and post-processing products.

Mr. Yen earned his Masters Degree of Mechanical Engineering from the University of Michigan, Ann Arbor in 1988. He is conversant in English, Chinese and Japanese.

Altair ProductDesign is a global, multi-disciplinary product development consultancy of more than 500 designers, engineers, scientists, and creative thinkers. As a wholly owned subsidiary of Altair Engineering, Inc., this cross functional organization is best known for its leadership in simulation-driven innovation and applying a user-centered and team-based approach to help clients bring innovative, profitable products to market faster.

Altair

Presentation Overview

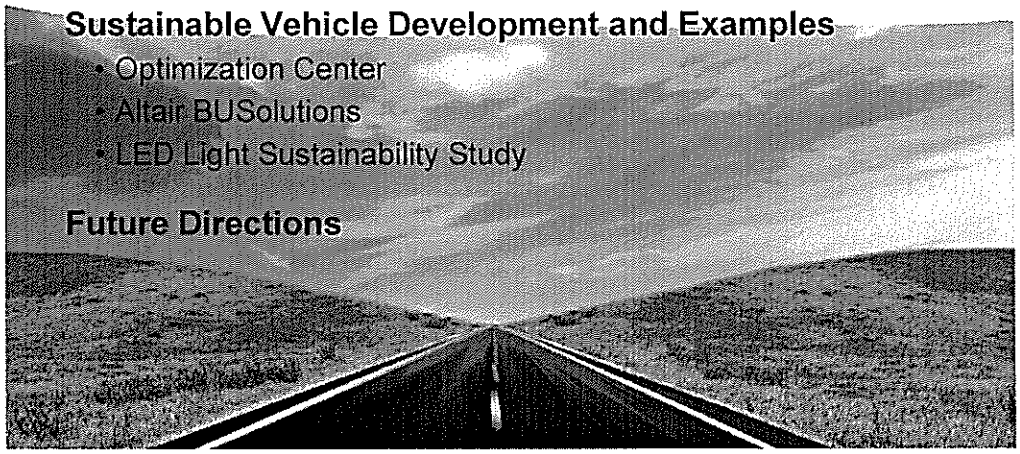
WHAT: Sustainability

- Life Cycle Assessment (LCA)
- Sustainable Innovation

Sustainable Vehicle Development and Examples

- Optimization Center
- Altair BUSolutions
- LED Light Sustainability Study

Future Directions



Electric Vehicle & Electromagnetic Effects

Dr. Andy Tong　童坤華 博士

Abstract

GM EV1 review

General Motors designed the EV1 from the ground up. It incorporates many new and unique technologies into a single package. The automobile combined lightweight materials, aerodynamic design, a system that recharges the batteries when braking, a sophisticated computer-controlled propulsion to create an electric vehicle, and it is the world's most energy efficient vehicle platform.

Introducing the Chevrolet VOLT

Chevy Volt is a front-drive compact that seats four. It will go an estimated 40 miles on a plug-in charge, but has a four-cylinder gasoline engine that kicks in to run a generator to power the electric motor. It has an extended range of 300 miles using this method. Volt is schedule for production this year.

How Electromagnetic Interference might affect the vehicle systems

Electronics are widely used to control various functions in the vehicle. The network of electronic units may be affected by Electromagnetic Interference (EMI), especially the electronic drive systems for EV or Hybrid vehicles. From the EMI point of view, the integration of electric drive systems into cars represents a substantial challenge.

Biography

Andy Tong is Vice President of engineering at Starlight Technologies, Inc.

His professional career includes five years with Chrysler Corporation and 30 years with General Motors.

He had extensive experience in Electric & Hybrid vehicle development, over 12 years, as the Lead Engineer for electric propulsion system on GM's EV 1 Project.

He remains enthusiastic about EV & Hybrid vehicles, and he is currently involved in developing and promoting electric vehicles for consumer and commercial use.

Presentation Overview

- GM EV1 review
- Introducing the Chevrolet VOLT
- How Electromagnetic Interference might affect the vehicle system

Vehicle Active Safety – Present and Future

Dr. William Lin　　林勤緯 博士

Abstract

Among all features a driver desires of the vehicle, safety is of the primary concern that supersedes comfort and convenience, vehicle performance and even fuel economy. Over the years vehicle safety has been greatly improved to meet the challenge from various dimensions including the ever-changing driving environment, conflicting requirements arising out of demands on fuel economy, cost of manufacturing, and even uncertainty in driving behaviors. While passive vehicle safety designs and systems have been contributing to a great extent in reduction of the degree of injury and number of fatality in vehicle crashes, active safety systems are contributing to avoiding or mitigating potential vehicle crashes via control of vehicle maneuvers at the critical moments.

Vehicle active safety can be achieved via control of chassis subsystems. For example, antilock braking systems prevent wheel-lock during emergency braking over slippery surfaces to prevent vehicle skidding out of control. Vehicle stability control using differential braking helps position the vehicle to the desired direction during a potential spin-out or plowing condition. Integration of front active steering further reduces stress of the driver during the emergency maneuver, and integration of rear steering control provides driver with desired vehicle performance under otherwise harsh and unacceptable driving conditions. Integration of surround sensing further provide advance control actions to avoid potential crashes

Advanced active safety system incorporating driver characterization is also addressed in this presentation. The impact of driving skill, driving style as well as driver's state of alertness in vehicle handling can also lead to much more sophisticated vehicle active safety systems in the future.

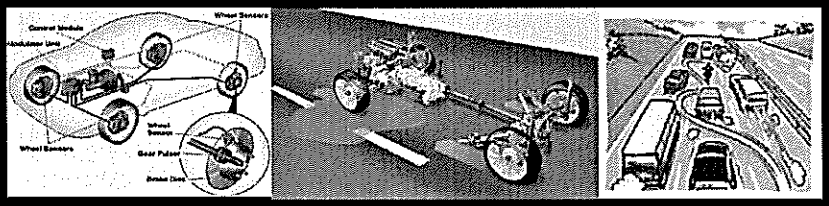
Biography

Dr. William C. Lin received his B.S. degree in Electrical Engineering from National Taiwan University in 1973, and his M.S. and PhD degrees in Electrical Engineering from University of Illinois at Urbana-Champaign in 1977 and 1979, respectively. He also received his J.D. degree from University of Detroit Mercy School of Law in 1996. Dr. Lin joined General Motors R&D Center in 1979, he has contributed to research and development in various advance automotive control systems including powertrain control, ABS and TCS systems, vehicle stability enhancement systems, integrated chassis control systems for vehicle active safety as well as driver characterization and driver-in-the-loop vehicle controls. Dr. Lin has many technical publications and 47 U.S. patents issued to date. Dr. Lin is a 3-time recipient of General Motors "Boss" Kettering Awards, 4-time recipient of GM R&D Center McCuen Award of Special Achievement, and is a recipient of the 2004 Asian American Engineer of the Year Award. Dr. Lin has retired from GM at the end of 2008, and is presently a practicing patent attorney and consultant in automotive engineering.

Presentation Overview

Vehicle Active Safety – Present and Future

- Chassis control systems
  - Braking, steering, suspension
- Vehicle control systems
  - Sensing and controls
- Driver-in-the-loop control systems
  - Driver characterization & adaptation



An Introduction to the US Automotive Crash Safety

Dr. Kevin Wang　王惠章 博士

Abstract

US auto market has been the largest one in the world. Although its position has been challenged by China recently, partly due to last year's financial crisis, it is still a vital market to win for most of the major auto companies and part suppliers. To enter into the market, an understanding of the automotive safety regulations will be an important step. This presentation will discuss major regulatory requirement for vehicles under about 10,000 lbs (4545 kg) with focus on regulations related to front, side and rear crash areas, which, in other words, the 49 CFR Part 571.200 regulation series.

Biography

Experience

1998-2010	GM Safety Integration Group. Full vehicle crash safety
1998-1998	Chrysler Jeep and Truck Safety and Crash Group. Full vehicle crash safety
1995-1998	GM Small Car Structure/Safety Group. Full vehicle crash safety
1991-1993	GM CPC and IFG groups. Component and body structure durability analysis
1986-1988	Tatung Co., Taiwan. Plant automation, product design

Education

1995	Ph.D., Bioengineering Ctr., Mech. Engg., Wayne State University, Detroit, MI Human Modeling in Crash Safety (thesis), Spinal Injury and Low Back Pain, Femur Fracture
1989	M.S., Mech. Engg., Wayne State Univ., Detroit, MI Classic and Modern Control Theories (optimal control, adaptive control, bond graph theory)
1984	B.S., Mech. Engg., Tatung Institute of Technology, Taiwan

Presentation Overview

- Introduction to the US Code of Federal Regulations
- Automotive Crash Safety Regulation Overview

  571.201 Occupant protection in interior impact.
  571.202 Head restraints
  571.203 Impact protection for the driver from the steering control system.
  571.204 Steering control rearward displacement.
  571.205 Glazing materials.
  571.206 Door locks and door retention components.
  571.207 Seating systems.
  571.209 Seat belt assemblies.
  571.210 Seat belt assembly anchorages.
  571.212 Windshield mounting.
  571.213 Child restraint systems.
  571.216 Roof crush resistance.
  571.219 Windshield
  571.223 rear impact guards.
  571.224 Rear impact protection.
  571.225 Child restraint anchorage systems.
  571.301 Fuel system integrity.
  571.305 Electric-powered vehicles: electrolyte spillage and electrical shock protection.
  571.208 Occupant crash protection.
  571.214 Side impact protection.

- Reality and Practices

Dual Clutch Layshaft Sequential-Shift Transmissions

Dr. Calvin Lee 李春亮 博士

Abstract

Dual-clutch transmission (DCT) is a growing and promising technology. It offers the flexibility and efficiency of the manual transmissions and capability and comfort of the planetary transmissions. The main driver of DCT is, no doubt, the fuel efficiency. However, there are other challenges and the associated opportunities. The higher cost (at least for now), long-term clutch durability concerns, and unique packaging requirements of DCTs are being worked on. And replacing the torque converter with dual-clutch opens a door to many opportunities such as advanced controls of clutch operations and slip, actuator designs, clutch materials, new and better lubricants, clutch cooling, and combinations of all of above.

Biography

Education

B.S. - Mechanical Engineering, National Cheng Kung University (國立成功大學)

M. S. – Power Mechanical Engineering, National Tsing Hua University (國立清華大學)

Ph. D. – Mechanical Engineering, University of Michigan, Ann Arbor, MI, USA

Research & Study Topics

M.S. – Finite Element Methodology in Fluid Dynamics

Ph. D. – Engineering Systems Design Synthesis: An Artificial Intelligence Approach

Chung Shan Institute of Science and Technology (中山科學研究院)

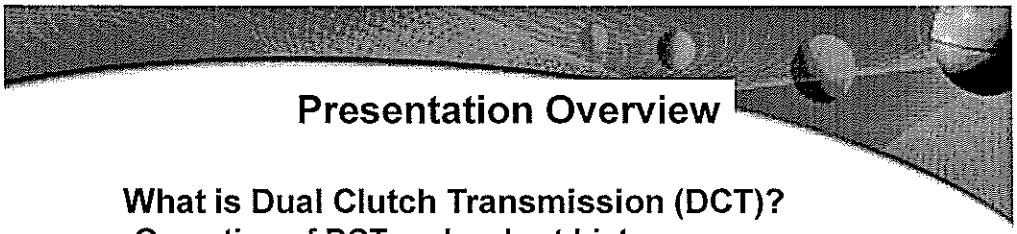
- Design & Simulation of Deployable Folded Wings of Air-to-Surface Missiles

Ford Motor Company:

- Advanced Powetrain Engineering - Development & Implementation of New Technologies
- Powertrain System Architecture Strategy
- Preprogram Powertrain Systems Integration & Implementation
- Certified Six Sigma Black Belt

Patent Awards

- An Engine Offset Crank Architecture (Ford Motor Company)
- A Variable Geometry Intake Manifold Design (Ford Motor Company)
- A Simple Variable Cam Timing Architecture (Ford Motor Company)
- A Suction Tape
- A Modular Lens Cover System for Automotive Head and Tail Lights
- A Low-cost Cross-flow Wind Turbine with a Variable Pitch Mechanism



Presentation Overview

What is Dual Clutch Transmission (DCT)?
•Operation of DCT and a short history

Why DCT now?
•Performance characteristics, fuel efficiency, and advancement of enabling technologies

Comparison of Different Transmissions
•Efficiency, cost, weight, features, and market trend

Challenges and Opportunities
•How to Develop Low Cost DCTs

How to Develop Electrical/Electronics Module Validation Plan

Mr. Julius Wang 王政 先生

Abstract

Automotive Electrical/Electronics (E/E) has played a major role since early 1970s and continues to influence/create major functionalities of the vehicle. The total number of microprocessors is approaching 50 on an average vehicle. These microprocessors are integrated within modules (sometimes called ECU, electronics control unit) and are located inside the vehicles from passengers cabin to engine compartment. To ensure a satisfactory customer ownership experience, the module reliability must be designed and validated.

The question is how a validation plan should be developed. This presentation outlines the steps to do so with focus on the hardware reliability under various environmental conditions. The six steps are:

1. What do customers want?
2. What does the product do?
3. How is it used?
4. In what environment?
5. How to validate 10-year life on lab bench?
6. Putting it all together with how many?

Biography

Mr. C. Julius Wang is the Senior Manager of System & Component Quality/Reliability and Regulatory Quality at Chrysler Group LLC. He is responsible for the system reliability of Body, Interior, Chassis, Electrical/Electronics, and Engine Systems. Also he is responsible for business process improvement as a result of recalls. Julius has 20 years of experience with Chrysler and 2 years P&L responsibility with Mercedes-Benz Technology North America. He has extensive experience in the strategic planning and technical expertise in all facets of quality/reliability.

Julius has received Chrysler Award for Excellence in 1991 and 1995. He also received Cecil C. Craig Award from the American Society for Quality (ASQ) Automotive Division in 1990. He was on the Editorial Board for the *Quality and Reliability Engineering International Journal* from 1998 to 2008. He has been an active member of the SAE/ISO environmental testing committee and SAE automotive reliability standards committee.

Julius also served as Adjunct Professor at Industrial and Manufacturing Engineering Department of Wayne State University (Detroit, MI) from 1996 to 2005. Julius has more than 36 technical publications in quality, reliability, and accelerated testing.

How to Develop Electrical/Electronic Module Validation Plan

Agenda

- Why Automotive E/E Environment /Reliability Testing
- Automotive E/E Reliability Trend
- E/E Testing Validation Plan Development

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