



Texas Instruments
Tech Day Brazil 2009
Abstracts

Track & Course	Presenter	Abstracts
S.Paulo Room		
OMAP3 Hardware and Software Architecture Overview	Martin Burgos	<p>This session will provide a detailed software- and hardware-architecture tutorial for TI's OMAP35x devices. OMAP35x applications processors offer a variety of combinations of the ARM® Cortex®-A8 core, multimedia-rich peripherals, OpenGL® ES 2.0 compatible graphics engine, video accelerators, and TMS320C64x+™ DSP core. You will also learn more about the TI software Framework, which supports the ARM, DSP, and ARM+DSP-based processors available from TI. Using application programming interfaces (API's) for I/O (drivers) and the video, imaging, speech, and audio (VISA) algorithms, you can easily access the potential of TI's DSP processors and hardware accelerators within your Linux/ARM programs.</p>
Introduction to OMAP-L1 Low Power Processors	Rafael Souza	<p>The OMAP-L137 is a Low-power applications processor based on an ARM926EJ-S™ and a C674x DSP core. It provides significantly lower power than other members of the TMS320C6000™ platform of DSPs. This session will review detailed, high-level block diagrams and give a deep-dive tutorial on hardware and software topics.</p>
Introduction to Code Composer Studio™ (CCS) v4.0	Rafael Souza	<p>CCS v4.0 is a major new release of Code Composer Studio that is based on the Eclipse opensource software framework. Eclipse is becoming very popular in the embedded development community and is now becoming a standard in development environments. This session will provide an overview and explain advantages to using CCS v4.0 for your development.</p>
Jump Start Your Digital Video Design with TI's DM365	Martin Burgos	<p>The DM365 includes an ARM9, a video processing subsystem (VPSS) including Image Signal Processing (ISP), production-ready codec bundles and integrated peripherals. Attend this session to learn more on how the DM365 processor allows developers to access H.264 and other video formats for a variety of resolutions including 1080p HD and reduce system cost up to 25 percent with peripheral and software integration.</p>
Introduction to Stellaris® ARM Cortex™-M3 MCUs	Scott Emley	<p>TI's Stellaris MCUs bring the ARM Cortex-M3 core along with advanced communication capabilities, including 10/100 Ethernet MAC+PHY, CAN, USB On-The-Go, USB Host/Device, SSI/SPI, UARTs, and I2C. As well as an extensive range of over 20 reference design, evaluation and development kits starting at \$49. Stellaris MCUs are targeted at highly-connected applications including monitoring, building controls, network appliances and switches, factory automation, electronic point-of-sale machines, test and measurement equipment, medical instrumentation and gaming equipment. This presentation will cover silicon overview, tools overview, StellarisWare overview, application areas, and a question and answer session.</p>
Implementing Smart and Flexible Power Line Modem for AMR/AMI and Industrial Applications on TMS320F28x™ 32-bit	Miller Adair	<p>From smart electrical meters and automated meter infrastructure (AMI) to industrial applications ranging from lighting, inverters (solar, servo and drives, HVAC system) and home automation systems, Power Line Communication (PLC) is booming and becoming a popular communication solution to implement remote control. Used for outdoor or indoor communication, implementation is inexpensive from an infrastructure point of view as it uses the existing electrical grid. Developers will however need to cope with various protocols, evolving standards and regulations requiring the need for smart and flexible solutions. In addition, system cost optimization is leading to the convergence of the primary application and the communication on a single device requiring the need for a product portfolio that offers scalability and performance. The TMS320F28x™ 32-bit microcontrollers from Texas Instruments enable developers to implement flexible and smart PLC modem in software for narrowband solutions (up to hundreds of kbps) and provides the unique opportunity to integrate the primary application</p>
Linux Development Overview on TI Processors	Rafael Souza	<p>This session will explore the various Linux development options available for TI's embedded processors such as DaVinci™ and OMAP™. Both community and commercial offerings will be discussed, including the benefits of each.</p>

Jd. Europa Room

<p align="center">C2000 Digital Power Solutions: AC/DC and DC/DC</p>	<p align="center">Miller Adair</p>	<p>Digitally controlled power conversion is the enabling force of efficiency and performance improvement in today's power supply and power conversion designs. Texas Instruments' digital power conversion controllers are the recognized leaders in this market. This presentation will focus on introducing TI's latest development solutions for both AC/DC rectifier power supply and DC/DC converters including Power Factor Correction (PFC), Phase-shifted DC/DC, and highly efficient resonant DC/DC etc. An introduction of basic power conversion concepts and topologies such as PFC, DC/DC, interleaved PFC and DC/DC, and resonant DC/DC, will also be presented. Attendees will learn basic and advanced digital power conversion concepts and gain an understanding of TI's digital power solutions</p>
<p align="center">Tackling EMI and RFI at the Board and System Level</p>	<p align="center">Rick Downs</p>	<p>Electromagnetic Interference (EMI) and Radio Frequency Interference (RFI) can affect any system in an undesirable manner as the proliferation of unintentional radiators and receptors continue to increase. EMI and RFI, an undesirable byproduct of electrical systems, produce a wide range of frequency spectra that can affect otherwise properly operating circuits. During this seminar hour, we will review the fundamental principles of radiated interference and coupled interference, along with the respective allowed limits for both of these interference sources. In this discussion, we will describe transmitters and receivers along with techniques to mitigate the effects of both culprits. The solutions we will cover will be effective power-line filtering, proper filtering for input signals of high-gain circuits, and details on key components. Finally, we will discuss the common rules of thumb for wire and PCB routing to minimize EMI and RFI effects. With this seminar you will see some basic methods that will help reduce sources and receptors of EMI and RFI events in and near your circuits.</p>
<p align="center">Precision Analog Designs Demand Good PCB Layouts</p>	<p align="center">Rick Downs</p>	<p>Precision systems demand attention to details. Good circuit design and high performance components are critical, but to get the best system performance a good foundation at the printed circuit board (PCB) level is necessary. Techniques shown in this presentation will aid in solid designs, by considering component selection and placement, routing, grounding, and bypassing. In this session, you will learn some fundamental approaches to PCB design that will help you achieve first-pass success with your precision analog designs.</p>
<p align="center">Circuit Isolation Techniques and Implementations</p>	<p align="center">Tim Lafferty</p>	<p>Multiple options are now available to electronics designers to implement galvanic isolation. Apart from isolation technologies like capacitive, optical and inductive/magnetic to choose from, they must also contend with the various isolation standards regarding voltage ratings and creepage/clearance distances. This discussion intends to simplify the decision making associated with choosing the right isolation solution.</p>
<p align="center">Considerations when Driving DC Powered Motors</p>	<p align="center">John Garcia</p>	<p>DC powered motors come in several configurations (Brushed, stepper and BLDC) and sizes. When deciding how to drive these motors, it is important to take many criteria into account at both the motor and system level. The goal of this discussion is to familiarize the user with the critical elements of both motors and drivers, along with their ramifications from a system level. Texas Instruments is developing a broad portfolio of devices aimed at providing cost effective, high performance solutions to meet a wide variety of motor driver needs.</p>
<p>The Magic of Multiphase -- A Comparison of a 2-Phase DC/DC Power Supply versus a Similar Single-Phase Controller Highlighting the Trade-Offs and Challenges of Each Design</p>	<p align="center">Robert Taylor</p>	<p>Several multiphase DC/DC controllers have recently been introduced by TI (and competitors) that promise more than a higher output current capability. A multiphase and single phase design with the same output voltage and current are constructed and analyzed to compare and contrast the trade-offs of size, ripple, component choice, efficiency, and size. Learn when to recommend a multiphase over a single phase solution and how to extract its value based on the designer's system requirements.</p>

Ibirapuera Room

<p align="center">High-Speed Op Amp Stability</p>	<p align="center">Jim Karki</p>	<p>While you may want an amplifier, it often seems that higher speed devices would prefer to act as your local oscillator. Assuming this was not your intent, this session will review some of the common sources of instability in high speed op amp circuits and typical paths to resolution. If the oscillation is hiding (or intermittent), some techniques to discover this distemper will be covered. Overall loop gain phase margin analysis will be reviewed along with some common circuits with hidden phase margin hazards. Simulation techniques to evaluate phase margin will be shown with an indication of where the models may fall short. Input stage local oscillations and power supply related stability issues will also be shown.</p>
<p align="center">High Performance Differential ADC Input Interface Design</p>	<p align="center">Jim Karki</p>	<p>Most emerging high performance ADC's require a differential input interface. Designing that interface with minimal SFDR and SNR loss from the converter specifications is a task every data acquisition designer must face. A review of converter SNR and SFDR characterization will lead into a discussion of combining the SNR and SFDR delivered up to the converter with the ADC specifications. This can then be used to set a performance target in this last stage interface. Working from low to high frequency then a very low distortion interface suitable for 16- to 18-bit converters will be shown. Next, a wideband first Nyquist zone design will be described and finally a high performance IF interface for an undersampled application will be described.</p>
<p>Li-Ion and LiFePO4 Chemistry Technology and Charging Solutions with Various Input Sources</p>	<p align="center">Wing Yu</p>	<p>Battery operated portable power devices have been growing significantly. This session first discusses Li-Ion and LiFePO4 chemistry characteristics, battery charging requirements and how the battery charger meets these requirements for achieving high safety, powering the system while charging the battery. How to charge a Li-Ion battery from a solar cell panel and LiFePO4 battery chargers will be discussed.</p>
<p>Design Challenges and Solutions of a System-side Fuel Gauge for Handheld Devices</p>	<p align="center">Wing Yu</p>	<p>The system-side fuel gauge can reduce the end users total cost for buying a replacement battery pack when the original battery life has expired. This article discusses how to extend the range of systems with imbedded gauging while satisfying increased accuracy requirements of modern hand-held devices and improving battery run-time. System-side battery management system advantages and design challenges including detection of the battery's initial capacity upon insertion, co-operation with battery charging system, and minimizing power consumption are analyzed in detail. Applicability of different capacity gauging methods to system-side gauging is reviewed. Use of battery state of health (SOH) information based on actual impedance and capacity measurements for improving the indication of the battery degradation is discussed.</p>
<p align="center">Analog Audio Interfaces Getting audio in and out of your box - tips, tricks and solutions.</p>	<p align="center">Dafydd Roche</p>	<p>A brief look at how we transmit and receive analog audio over various interfaces, some of the problems we face, and some tricks to overcome them.</p>
<p>Digital Audio Interaces - S/PDIF, AES/EBU and other digital audio interfaces - tips, tricks and solutions.</p>	<p align="center">Dafydd Roche</p>	<p>An in-depth look at consumer and professional digital audio interfaces, a look at USB solutions and some discussion about the adoption of multichannel interfaces. (e.g. over Ethernet Cable, Optical cable etc)</p>