IEEE中華民國分會補助各支會活動成果報告表

96.5.3

會議名稱：<兩場專題演講> 1. Low Power Electronics for Inertial Sensors 2. Information Processing for Future Healthcare Systems		
舉辦日期：98/11/12		
主辦機構： IEEE SSCS Taipei Chapter、晶片系統國家型科技計畫辦公室、交大電子系	舉辦地點：交通大學電子系	
舉辦支會：SSC37	支會主席：陳巍仁	TEL：03-5712121*54172

原預估出席人數：
1. Low Power Electronics for Inertial Sensors: 60 人
2. Information Processing for Future Healthcare Systems: 30 人。

會議當天實際出席人數：
1. Low Power Electronics for Inertial Sensors: 58 人
2. Information Processing for Future Healthcare Systems: 35 人。

會議重要成果：（請確實填寫，作為下屆補助經費參考）

請列舉本會議重要成果（含對IEEE之重要貢獻）

此專題演講邀請國外專家學者介紹Low Power Electronics for Inertial Sensors以及Information Processing for Future Healthcare Systems，藉以提昇國內相關技術人才設計能力，促進國內產、學界保持與國際先進技術接觸。

需繳交資料：	1. 活動文章（約500字，MS-Word格式，中英文版各乙篇） 2. 照片2-4張（JPEG檔/300dpi） 上述資料請自行登錄於分會網頁，並將電子檔e-mail至陳虹妙(nao@cc.nctu.edu.tw)信箱。

Low Power Electronics for Inertial Sensors

- 時間：98年11月12日 15:00~16:00
- 地點：國立交通大學(光復校區)工四館B1國際會議廳

- 主講人：**Prof. Bernhard Boser (UC Berkeley, SSCS vice-president)**
  (elected as the SSCS president for 2010 and 2011)

講員簡介: Diploma in Electrical Engineering from ETH Zurich, Ph.D. from Stanford University in 1985 and 1988. Until 1992 at AT&T Bell Laboratories. Since 1992 Professor in EECS at UCB. Electronics for inertial, bio, medical, and image sensors. Program committees: ISSCC, VLSI Symposium, Transducers, Hilton Head. Fellow IEEE. Chief Scientist of SiTime, a fabless semiconductor company he co-founded in 2004.

演講大綱：Inertial sensors have been used since the 1950s in aerospace and defense applications primarily for navigation. The size, power, and cost reduction enabled by micromachining and custom electronic interfaces opens many new applications in the automotive and consumer sectors. Extensively used since the 1990s as crash sensors in vehicles, accelerometers and gyroscopes are increasingly used also to detect and restore loss of steering control using individual wheel breaking. More recently consumer applications for gaming and in mobile communication devices are fueling the rapidly expanding market.

We present an unconventional approach to gyro interface electronics that combines resonant gain boosting and sub-kT/C low noise amplification to realize more than an order-of-magnitude power reduction compared to conventional solutions. The device employs positive feedback to ensure robust and stable operation to accommodate over 200 degrees phase shift from parasitic resonances and transport delay. The measured spot noise of the gyro is 14deg/h/rt-Hz in a 50Hz signal band and 1mW power dissipation.

主辦單位：IEEE SSCS Taipei Chapter，晶片系統國家型科技計畫辦公室

協辦單位：交通大學電子系

Information Processing for Future Healthcare Systems

- 時間：98年11月12日 16:00~17:00
- 地點：國立交通大學(光復校區)工四館528會議室

- 主講人：**Prof. Dejan Marković (UCLA)**

講員簡介：Dejan Marković is an Assistant Professor of Electrical Engineering at the University of California, Los Angeles; and a member of the UCLA Biomedical Engineering Interdepartmental Program. He completed the Ph.D. degree in 2006 at the University of California, Berkeley. In recognition of the impact of his Ph.D. work, he was awarded 2007 David J. Sakrison Memorial Prize at UC Berkeley. His current research is focused on integrated circuits for emerging radio and healthcare systems, design with post-CMOS devices, optimization methods and CAD flows. He received an NSF CAREER Award in 2009 for the research described in this talk.

演講大綱：The talk will present methods for practical realization of sophisticated digital signal processing (DSP) algorithms for healthcare applications that require many-channel electrophysiological recordings. An automated architecture design framework will generate dual output: real-time solution that meets power density constraints of medical implants, and solution for accelerated processing by hardware emulation. Orders of magnitude improvements in the number of recording channels and decreased hardware cost will be demonstrated. A real-time implantable DSP chip will demonstrate simultaneous processing of 64 channels, with over 90% data compression for wireless telemetry. A DSP architecture for hardware emulation can achieve a 10,000 times speed-up in data processing compared to state-of-the-art computers. A successful integration of neural-data processing will significantly advance many applications such as visual, auditory, motor, and cognitive prosthetics. Methods for achieving faster analysis of electrophysiological data will provide neuroscientists quicker access to important research data and improve the overall quality of living for persons with neurological disorders. The methods presented here are also applicable to other emerging biomedical applications that require energy- and cost-efficient data processing.

主辦單位：IEEE SSCS Taipei Chapter，晶片系統國家型科技計畫辦公室

協辦單位：交通大學電子系