

# **2014 IEEE Topical Conference on Biomedical Wireless Technologies, Networks, and Sensing Systems**

**(BioWireleSS 2014)**

**Newport Beach, California, USA  
19-23 January 2014**



**IEEE Catalog Number: CFP14BIO-POD  
ISBN: 978-1-4799-5449-0**

---

## SESSION LIST

- ❖ TU1D : Wireless Technologies for Biosignals and Modeling in Medical
- ❖ TU3D : PAN, BAN, Energy Scavenging, and Remote Patient Monitoring
- ❖ TU5D : Wireless Position and Location in Medicine
- ❖ WE1D : Micro-Sensors and In-Vivo Microsystems
- ❖ WE2D : Microwaves in Biological Applications and Interaction with Biological Tissues

---

---

## TU1D: Wireless Technologies for Biosignals and Modeling in Medical

Chair: Dominique Schreurs, KU Leuven, Belgium

Co-Chair: Mohammad-Reza Tofghi, Penn State University, USA

Venue: Cardiff, 08:00 – 09:20, Tuesday 21 January 2014

---

PAGE 1  
TU1D-1  
08:00



### Monitoring Respiratory Pattern in Adult and Infant via Contactless Detection of Thorax and Abdomen Movements Through SoC UWB Pulse Radar Sensor

(*Domenico Zito, Domenico Pepe*)

PAGE 4  
TU1D-2  
08:20



### PXI-Based Non-Contact Vital Sign Detection System

(*Sharmi Banerjee, Changzhan Gu, Changzhi Li*)

PAGE 7  
TU1D-3  
08:40



### Movement-Immune Respiration Monitoring Using Automatic DC-Correction Algorithm for CW Doppler Radar System

(*Yiran Li, Guochao Wang, Changzhan Gu, Changzhi Li*)

PAGE 10  
TU1D-4  
09:00



### High-Amplitude Motion Cancellation Method for Handheld UWB Doppler Radar

(*Lingyun Ren, Yun Seo Koo, Yazhou Wang, Gary To, Mohamed Mahfouz, Aly E. Fathy*)

---

## TU3D: PAN, BAN, Energy Scavenging, and Remote Patient Monitoring

Chair: Dietmar Kissinger, FAU Erlangen-Nuremberg, Germany

Co-Chair: Mohamed Mahfouz, University of Tennessee Knoxville, USA

Venue: Cardiff, 13:30 – 14:50, Tuesday 21 January 2014

---

Not  
Available  
TU3D-1  
13:30

### Electrophysiologic Monitoring and Minimally Invasive Neurosurgery: Opportunities for Medical Engineering (*Invited Paper*)

(*C. Chen*)

PAGE 13  
TU3D-2  
13:50



### SAR Evaluation of Ultra Wideband (UWB) Textile Antennas

(*P.J. Soh, G.A.E. Vandenbosch, F.H. Wee, M. Mercuri, A. van den Bosch, M. Martinez-Vazquez, D. Schreurs*)

PAGE 16  
TU3D-3  
14:10



### Design of Wireless Waist-Mounted Vital Sensor Node for Athletes — Performance Evaluation of Microcontrollers Suitable for Signal Processing of ECG Signal at Waist Part

(*Shin Okamoto, Tetsuo Tsujioka, Shinsuke Hara, Hajime Nakamura, Takashi Kawabata, Kenji Watanabe, Masanao Ise, Noa Arime, Hiroyuki Okuhata*)

PAGE 19  
TU3D-4  
14:30



### A Mobile and Wireless Approach for Cardiac Output Monitoring

(*Daniel Teichmann, Thorsten Bartelt, Steffen Leonhardt, Marian Walter*)

---

---

## TU5D: Wireless Position and Location in Medicine

Chair: Changzhi Li, Texas Tech, USA

Co-Chair: Michael Kuhn, University of Tennessee Knoxville, USA

Venue: Cardiff, 16:00 – 17:20, Tuesday 21 January 2014

---

PAGE 22  
TU5D-1  
16:00



**Asynchronous Subthreshold CMOS Event Detector for Wireless BAN Sensor Nodes**  
(*Florian Grimminger, Gregor Kowalczyk, Hartwig Unterassinger, Andre Schwarzmeier, Georg Fischer, Robert Weigel, Dietmar Kissinger*)

PAGE 25  
TU5D-2  
16:20



**Design and Implementation of Wearable RFID Tag for Real-Time Ubiquitous Medical Care**  
(*Yeh-Cheng Chen, Hung-Min Sun, Ruey-Shun Chen*)

PAGE 28  
TU5D-3  
16:40



**A Low Power Fall Detection and Activity Monitoring System for Nursing Facilities and Hospitals**  
(*Andre Schwarzmeier, Robert Weigel, Georg Fischer, Dietmar Kissinger*)

PAGE 31  
TU5D-4  
17:00



**Detection of Trapped Survivors Using 270/400MHz Dual-Frequency IR-UWB Radar Based on Time Division Multiplexing**  
(*Zhao Li, Hao Lv, Yang Zhang, Guohua Lu, Sheng Li, Xijing Jing, Jianqi Wang*)

---

## WE1D: Micro-Sensors and In-Vivo Microsystems

Chair: Jung-Chih Chiao, University of Texas Arlington, USA

Co-Chair: Rizwan Bashirullah, University of Florida, USA

Venue: Cardiff, 08:00 – 09:20, Wednesday 22 January 2014

---

PAGE 34  
WE1D-1  
08:00



**A Power Consumption Optimized Reflective In-Ear Pulse Oximeter for Mobile Health Monitoring**  
(*Boudewijn Venema, Matthias Simon Wolke, Vladimir Blazek, Steffen Leonhardt*)

PAGE 37  
WE1D-2  
08:20



**Optimal Design of Energy Efficient Inductive Links for Powering Implanted Devices**  
(*Fabian L. Cabrera, F. Rangel de Sousa*)

PAGE 40  
WE1D-3  
08:40



**A Low Switching Frequency AC-DC Boost Converter for Wireless Powered Miniaturized Implants**  
(*Hao Jiang, Ben Lariviere, Di Lan, Junmin Zhang, Jing Wang, Richard Fechter, Michael Harrison, Shuvo Roy*)

PAGE 43  
WE1D-4  
09:00



**Radiation Efficiency of Planar Implantable Antennas at ISM Band**  
(*Mohammad-Reza Tofighi, Shi-Min Huang*)

---

---

## WE2D: Microwaves in Biological Applications and Interaction with Biological Tissues

Chair: *Katia Grenier, LAAS CNRS, France*

Co-Chair: *Dietmar Kissinger, FAU Erlangen-Nuremberg, Germany*

Venue: *Cardiff, 10:10 - 11:50, Wednesday 22 January 2014*

---

PAGE 46  
WE2D-1  
10:10



### **Modeling and Characterization of BiCMOS Embedded Microfluidic Platform for Biosensing Applications (*Invited Paper*)**

*(C. Baristiran Kaynak, M. Kaynak, M. Wietstruck, S. Marschmeyer, P. Kulse, K. Schulz, H. Silz, A. Krüger, R. Barth, K. Schmalz, B. Tillack)*

PAGE 49  
WE2D-2  
10:50



### **Radio Frequency Detection and Analysis of Synthetic Particles**

*(Xiaodi Hu, Guofen Yu, JiWei Sun, David Moline, Pingshan Wang)*

PAGE 52  
WE2D-3  
11:10



### **An Inexpensive Backside-Sensing Coplanar Waveguide Sensor for Characterization of Liquids and Solids up to 40GHz**

*(S. Liu, I. Ocket, B. Nauwelaers, D. Schreurs)*

PAGE 55  
WE2D-4  
11:30



### **A Microstrip Resonant Biosensor for Aqueous Glucose Detection in Microfluidic Medical Applications**

*(Udo Schwerthoeffer, Christopher Warter, Robert Weigel, Dietmar Kissinger)*