WC 2006
World Congress on Medical Physics and Biomedical Engineering
Aug. 27 - Sep. 1, 2006  COEX Seoul, Korea

"Imaging the Future Medicine"

The Triennial World Congress of IUPESM
The 15th ICMP of IOMP
The 21st ICMBE of IFMBE

www.wc2006-seoul.org
T6 Poster Session (continued)  Exhibition Hall

2587. Measurement and Significance of Pacemaker Pulse Parameters  
Milan Tannenberg, Milan Sepsi

2588. Evaluation of Closed Eye Motion Monitoring by Wireless Communication  
Chi-Wen Hsieh, Sheng-Hung Wang, Tai-Lang Jong

2589. Development of a Superoxide Sensor for Real-Time Monitoring  
Kosuke Endo, Hiroko Asahara, Seiichi Mochizuki, Takehiro Miyasaka, Katsuhiko Tsujiioka, Kiyotaka Sakai

2590. A Compact PID Controlled Pressure Wave Generator  
Hermann Gilly, Stephan Tokaes, Michael Röhrich, Peter Hamm

2591. A Bidirectional Digital Data Transmission System using Capacitive Tuning of Inductive Coil Link for Neural Prosthetic Devices  
Choong Jae Lee, Soon Kwan An, Seung Woo Lee, Sun Jung Kim

2592. Neonatal Respiratory Monitoring System  

2593. 3 Dimensional Power Receiver for In Vivo Robotic Capsules  
Jong Dae Kim, Munho Ryu, Jongwon Kim, Hyun Uk Chin

2594. Estimation of an Aortic Pressure Waveform from Radial Pulse using ARX Model  
Young Ju Jeon, Yoon Sub Eom, Jun Oh Hwang, Heui Kyung Yang, Jae Joong Im, Sung Ha Park, Nam Sik Jung

2595. Study of Human Affective Response on Multimedia Contents  
Chang-Wei Hsieh, Chi-Te Shen, Yi-Ping Chao, Jyh-Horng Chen

2596. Relationship between Skin Impedance Calculated by a Transformation Method and Measured Impedance  
Hiromi Ishikawa, T. Inoue, Y. Kinouchi

2597. Wireless Intrabody Communication System for Neural Prosthesis  
Tae Hyung Lee, Jong Kunn Song, Sung June Kim

2598. Electrochemistry of Ferritin/Carbon Nanotubes  
Kwong-Min Shin, Sang Jun Park, Seoung Gil Yoon, Chang Kee Lee, Su Ryon Shin, Min Kyoon Shin, Bon Gang Gu, Min Sup Kim, Yu Jin Kim, Ji Won Lee, Seon Jeong Kim, Sun I. Kim

2599. Basis Research of Nail Style Photoplethysmogram Measurement System for Motion Artifact Reduction  
Yonguk Jeon, Ji Cheol Kim, Do Un Jeong, Cheol Han Kim, J.H. Ro, Gye Rok Jeon

2600. Angular Displacement Measurement using Optical Fiber  
Jeong-Whan Lee, Kang Hwi Lee, Lee-Yon Hong, Kyeongseop Kim, Jae-Hoon Jun, Dong-Jun Kim, Kyeong-Ho Kim

2601. Preparation of Thin Layers from Organic Metal Complexes by MAPLE  
Vladimir Myslik, Miroslav Jelinek, Martin Vrnata, Premysl Fitl, Rudolf Frycek, Tomas Kocourek, Filip Vyslovcil, Veronika Vymetalova

2602. Memory Performance, Hyperoxia, and Heart Rate Following Oxygen Administration  

2603. Location Estimation of In Vivo Robotic Capsule Relative to Arrayed Power Transmission Coils  
Ji Soo Hwang, Jong Dae Kim, Munho Ryu, Jongwon Kim

2604. Determination of the Number of Turns of the Power Receiving Coil for the In Vivo Robotic Capsule  
Jong Dae Kim, Munho Ryu, Jongwon Kim, Hyun Uk Chin

2605. X-Ray-Detector with CMOS Sensor Camera  
Y. Pitieeraphab, B. Laksanapanai, Polsart Lerpprapert, C. Pintavirooj

2606. The Implementation of an Internet Based Automatic Animal Behavior Experiment System  
Y.C. Li, Yu-Jen Chen, Ke-Ning Huang, Sun-Lon Jen, Ming-Shing Young

2607. Bioelectrical Impedance Analysis of Skin Rubor for Early Detection of Pressure Ulcer  
Tomoka Uchiuma, Y. Ohta

2608. Smart Bed Sensor Based on Imperfected Plastic Optical Fibers  
Jonathan Marwes, Anatoly Babchenko
Wireless Intrabody Communication System for Neural Prosthesis

Tae Hyung Lee\textsuperscript{1,2} Jong Keun Song\textsuperscript{1,2}, and Sung June Kim\textsuperscript{1,2}

\textsuperscript{1} School of Electrical Engineering and Computer Science, Seoul National University, \textsuperscript{2} Nano Bioelectronics & System Research Center, Seoul, Republic of Korea

leeth@helios.snu.ac.kr

Neural prosthesis is a system for replacing or augmenting a function that is lost or diminished because of the injury or disease on nervous system. In this paper, we suggest a wireless intrabody communication system for data transmission in the neural prosthesis. Because the data signal is sent through body which can be considered as a transmission medium, the system has high transmission efficiency. We found that 10MHz is the most suitable carrier frequency from both SPICE modeling and real body communication experiment. First of all, a prototype with 10MHz transmission frequency was made and tested to verify a performance of the proposed system. The system can be driven by small power battery source. In vitro test was done in 0.9% saline condition, and then in vivo test was studied in real body condition. The data coded in a form of PWM (pulse width modulation) were modulated with ASK (Amplitude Shift Keying). The coded data signal was transmitted to a receiver through body. Demodulated output signal was measured for confirming that the signal transmission through body was accomplished. Dynamic range of the system has 38.1dB when the system was operated at a bit rate of 500kbps and with an error rate of 10^{-6}.

Keywords : Neural Prosthesis, Intrabody Communication, Wireless System