ABSTRACTS

The 7th Annual Meeting of the
Korean Society for Brain and Neural Sciences

CULTURAL CENTER,
SEOUL NATIONAL UNIVERSITY,
SEOUL, KOREA

DECEMBER 1, 2004

THE KOREAN SOCIETY FOR BRAIN AND NEURAL SCIENCES
(후원: 한국학술진흥재단, 뇌기능활용 및 뇌질환치료기술개발사업단
뇌의약학사업단, 뇌신경생물학사업단)
NEURONAL SPIKE TRAIN DECODING FOR THE BRAIN-COMPUTER INTERFACE USING NONLINEAR FILTER BASED ON SUPPORT VECTOR MACHINE
S.S. Kim¹, K.H. Kim², S.J. Kim¹
¹School of Electrical & Computer Engineering, College of Engineering, Seoul National University,
²Department of Biomedical Engineering, College of Medicine, Yonsei University

For the brain-computer interface based on the activities of multiple cortical neurons, the decoding algorithm, which extracts the information on the movement parameters encoded within the neuronal spike train, is essential. We devised and implemented several decoding algorithms based on linear and nonlinear filtering in order to confirm the necessity of the nonlinear filter. Their performances were evaluated under various conditions by changing the number of neurons within the spike train, the length and the frequency of input to the decoding algorithms, and type and rates of error for the spike detection and classification. We confirmed the general superiority of nonlinear filters. The support vector machine showed the highest performance.

Key Words: Spike train, Training, Error rates, Decoding performance, BCI