

***Abstract: Efficient Digital Sound Processing for Speech/Music Classification Using Support Vector Machine***

Chungsoo Lim<sup>1</sup>, Seong-Ro Lee<sup>1</sup>, Dong-Kook Kim<sup>2</sup>, and Joon-Hyuk Chang<sup>3,\*</sup>  
<sup>1</sup>*Mokpo National University, Mokpo 534-729, Korea*  
<sup>2</sup>*Chonnam National University, Gwangju 500-757, Korea*  
<sup>3</sup>*Hanyang University, Seoul 133-791, Korea*  
*jchang@hanyang.ac.kr (Corresponding author)*

**Abstract**

Speech/music classification is an integral part of digital sound processing, especially in digital sound coding and digital audio document management. Among numerous speech/music classification frameworks, a support vector machine has gained popularity because of its decent classification accuracy and wide applicability. However, special care has to be taken for an efficient implementation of a support vector machine due to its high computational complexity, which is proportional to the number of trained support vectors. To reduce the computational burden, we propose a novel technique that effectively prunes minor support vectors in terms of their contributions to the final outputs of a support vector machine. We evaluate the proposed technique by applying it to a speech codec and verify the enhancement by measuring classification accuracy, overall execution time, and energy consumption.

**Acknowledgement**

This research was supported by the MKE (The Ministry of Knowledge Economy), Korea, under the ITRC (Information Technology Research Center) support program supervised by the NIPA (National IT Industry Promotion Agency) (NIPA-2011-C1090-1121-0007), and by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (2011-0022980). This work was also supported by the research fund of Hanyang University (HY-2011-201100000000210).