

EDITORIAL
SUPPORT VECTOR MACHINES FOR COMPUTER VISION
AND PATTERN RECOGNITION

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With their introduction in 1995, Support Vector Machines (SVMs) marked the beginning of a new era in the learning from examples paradigm. Rooted in the Statistical Learning Theory developed by Vladimir Vapnik at AT&T, SVMs quickly gained attention from the pattern recognition community due to a number of theoretical and computational merits. These include, for example, the simple geometrical interpretation of the margin, uniqueness of the solution, statistical robustness of the loss function, modularity of the kernel function, and overfit control through the choice of a single regularization parameter.

Like all really good and far reaching ideas, SVMs raised a number of interesting problems for both theoreticians and practitioners. New approaches to Statistical Learning Theory are under development and new and more efficient methods for computing SVM with a large number of examples are being studied. Being interested in the development of trainable systems ourselves, we organized an international workshop as a satellite event of the 16th International Conference on Pattern Recognition and decided to publish this special issue, emphasizing the practical impact and relevance of SVMs for computer vision and pattern recognition.

The contributions to this special issue are extended versions of a selection of papers presented at the First International Workshop on Pattern Recognition with Support Vector Machines, SVM2002, held in Niagara Falls, Canada, on August 2002. SVM2002 was organized by the Center for Artificial Vision Research at Korea University and by the Department of Computer and Information Science at University of Genova.

By March 2002, a total of 57 full papers had been submitted from 21 countries.

To ensure the high quality of workshop and proceedings, the program committee selected and accepted 30 of them after a thorough review process. Of these papers 16 were presented in 4 oral sessions and 14 in a poster session. The papers span a variety of topics in pattern recognition with SVMs from computational theories to their implementations. In addition to these excellent presentations, there were two invited papers by Sayan Mukerjee, MIT and Yoshua Bengio, University of Montreal.

From these 32 papers, eight papers were chosen to be published here, after another round of reviews for this special issue. They were suggested to be revised and extended to meet the more stringent qualification of journal publication.

David M. J. Tax and Piotr Juszczak present a simple preprocessing method which actively try to map the data to a spherical symmetric cluster and is almost insensitive to data distributed in subspace.

Ronan Collobert *et al.* present a “hard parallelizable mixture” methodology which yields significantly reduced training time through modularization and parallelization.

Jian-xiong Dong *et al.* propose a fast SVM training algorithm using effective integration of kernel caching, digest and shrinking polices and stopping conditions.

Roman Genov *et al.* present the *Kerneltron* which supports the generalization performance of a SVM and offers the bandwidth and efficiency of a massively parallel architecture.

Seonghoon Kang *et al.* introduce a real-time pedestrian detection system in outdoor environments using stereo-based segmentation and SVM-based classification with vertical edge features.

Leena A. Walawalkar *et al.* investigate gender classification using SVMs with visual (thumbnail frontal face) and audio (features from speech data) cues.

Mike Fugate and James R. Gattiker describe experiences and results applying SVM to a computer intrusion detection dataset.

Finally, Hyeran Byun and Seong-Whan Lee give a comprehensive survey on applications of SVMs for pattern recognition.

We would like to thank all the authors who submitted their papers to SVM2002 for their efforts, interest and collaboration during the workshop and this special issue would not have been possible otherwise. We are also very grateful to the program committee of SVM2002 and the reviewers of this special issue for their advice and expertise.