TEMPLE UNIVERSITY
Department of Mathematics

Applied Mathematics and Scientific Computing Seminar

Room 617 Wachman Hall

Wednesday, 7 September 2011, 4:00 p.m.
(refreshments and social at 3:45 p.m)

Symbol recognition using the geometrical properties of the matrix space using the Frobenius norm

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Abstract.

In the last few years, different approaches have been proposed and analyzed for the recognition of handwritten symbols (e.g., digits and letters), ranging from the implementation of neural networks to the use of classification methods based on statistical variability schemes. More involved and expensive techniques have also been recently developed that are based on the calculation of the Singular Value Decomposition (SVD) of the representing matrix or the tangential distance method. These more expensive techniques have been well accepted because of their high percentage of correct answers.

The goal in this talk is to propose an inexpensive numerical technique to identify as many unknown handwritten symbols as possible by calculating the cosines of the angles between the matrix representation of the unknown image and a previously identified group of images, using the geometrical properties of the space of matrices when embedded with the Frobenius norm. A variety of experiments are reported to illustrate the advantages of the new approach when compared with the one based on the SVD. (Joint work with L. Arvelo and M. Raydan.)