Big Data Mining by L2 SVMs - Geometrical Insights Help

Abstract: The seminar will introduce a novel learning algorithm for the class of L2 Support Vector Machines classifier dubbed Direct L2 SVM (DL2 SVM). The proposed comprehensive DL2 SVM algorithm avoids solving the QP problem and yet, it produces both the exact and the same results as the classic QP based solution in a significantly shorter CPU time. The connections between various (L2 & L1) SVM algorithms will be highlighted and some geometric properties of the DL2 SVM will be pointed at. All the other known L2 based SVMs can be looked at as the special cases of DL2 SVM. The DL2 SVM algorithm is based on solving the non-negative least squares problem which, in a striking difference to both the LS SVM and proximal SVM, is able to produce sparse solutions. The novel algorithm is a comprehensive in the sense that many other known algorithms can be looked at as the special cases of the DL2 SVM. The primary belief about the DL2 SVM is that it will be very suitable for solving classification (and regression) tasks for ultra large datasets, and this is where the "Big data" in the title is coming from. The claim is based on the fact that the matrix involved in NNLS is positive definite and that NNLS can be efficiently resolved by using Cholesky updating algorithm. In addition, it seems that the DL2 SVM will be very suitable algorithm for parallelization and, thus, for the use on the prevailing multicore computers and servers today.

Biography: Vojislav Kecman is associate professor in a CS Department at VCU, and director of a Learning Algorithms and Application Laboratory (LAAL). His area of interest is inventing and developing machine learning algorithms aimed at ultra-large datasets.

Robert Strack has a Master degree in Computer Science from AGH University of Science and Technology in Kraków, Poland and right now he is about finishing his PhD study at CS Department at VCU. His interests are in machine learning, data mining, and both novel and efficient programming.

Ljiljana Zigic has a Master degree in Mechatronics from the University of Novi Sad, Novi Sad, Serbia. The topics of her PhD dissertation are developing and implementing the fast machine learning and data mining algorithms. Her area of interest are novel machine learning algorithms.

Both Ljiljana and Robert are members of LAAL, at CS Department, SoE, VCU, Richmond, VA.

When: 12:00-1:00pm, Wednesday, April 24th, 2013
Where: Room E1232, School of Engineering-East Hall, Monroe Campus