

Topics in Machine Learning
MATH 80770
Fall 2018 MWF – 2:00-2:50
Professor Leonid Faybusovich

We will start with a crash course in probability theory. As an application, we prove several concentration inequalities essential in machine learning (Hoeffding, Bernstein, Bennet, Johnson-Lindenstrauss lemma). We then briefly discuss a probabilistic model of machine learning and proceed with the discussion of adaboost and kernel methods and methods of online machine learning. We will also discuss the major computational tool in machine learning: stochastic gradient algorithm for generally nonconvex objective functions. The background in optimization theory is helpful but not necessary (we will formulate the required results without proofs). Several possible research topics will be discussed in the end of the class. We will not follow any particular book. The references to various sources will be provided.