1129-68-316 **Alexandr Andoni*** (andoni@cs.columbia.edu), 450 Computer Science Building, 1214 Amsterdam Avenue, Mail Code 0401, New York, NY 10027, and **Huy Nguyen**, **Aleksandar Nikolov**, **Ilya Razenshteyn** and **Erik Waingarten**. *Embeddings of symmetric normed spaces with applications.*

High-dimensional Nearest Neighbor Search (NNS) problem is a classic problem at the crossroads of theoretical computer science and machine learning. In one variant of it, we are given a high-dimensional pointset P, and we are to find the closest pair of points inside P, i.e., a pair at the smallest distance. The main objective is to obtain algorithms running faster than simply enumerating all pairs of points in P, perhaps at the expense of outputting only an approximately-closest pair. Past research has shown efficient approximate algorithms for standard distances such as the Euclidean or the ℓ_p norms.

We give an algorithm for the general problem of NNS under an *arbitrary high-dimensional symmetric norm*. The crux of the algorithm is a near-isometric embedding of an arbitrary symmetric norm into an universal norm, whose dimension is only polynomially-bounded in the dimension of the original symmetric norm. This universal norm is a product space of simpler norms, namely of ℓ_p's and the top-k norm, for which we have (or design new) efficient algorithms. (Received March 19, 2017)