1153-62-110 **Ben Dai** (bda@umn.edu), School of Statistics, University of Minnesota, Minneappolis, MN, **Xiaotong Shen*** (xshen@umn.edu), School of Statistics, Minneapolis, MN , and **Junhui Wang** (j.h.wang@cityu.edu.hk), Department of Mathematics, Hong Kong, Hong Kong. *Embedding Learning.*

Numerical embedding has become one standard technique for processing and analyzing unstructured data that cannot be expressed in a predefined fashion. It stores the main characteristics of data by mapping it onto a numerical vector. An embedding is often unsupervised and constructed by transfer learning from large-scale unannotated data. Given an embedding, a downstream learning method, referred to as a two-stage method, is applicable to unstructured data. In this talk, we will present a novel method of embedding learning to deliver a higher learning accuracy than the two-stage method while identifying an optimal learning-adaptive embedding. Based on a concept of minimal sufficient learning-adaptive embeddings, we seek an optimal one to maximize the learning accuracy subject to an embedding loss constraint. Numerically, algorithms based on blockwise coordinate descent are used together with projected gradient descent to implement linear and feed-forward neural network classifiers, respectively. Finally, some theoretical aspects of embedding learning will be discussed, in addition to an application to representational learning and sentiment analysis. (Received August 20, 2019)