JHU: RAGS to Riches

Upcoming Fundamental Breakthrough

- We have previously demonstrated via theory and numerical experiments a significant improvement in terms of accuracy without sacrificing efficiency, over state of the art for (i) independence testing [1], (ii) linear classification [2], and (iii) non-linear classification [3] for high-dimensional data.

- We will extend these results to populations of networks with edge, vertex, and graph attributes

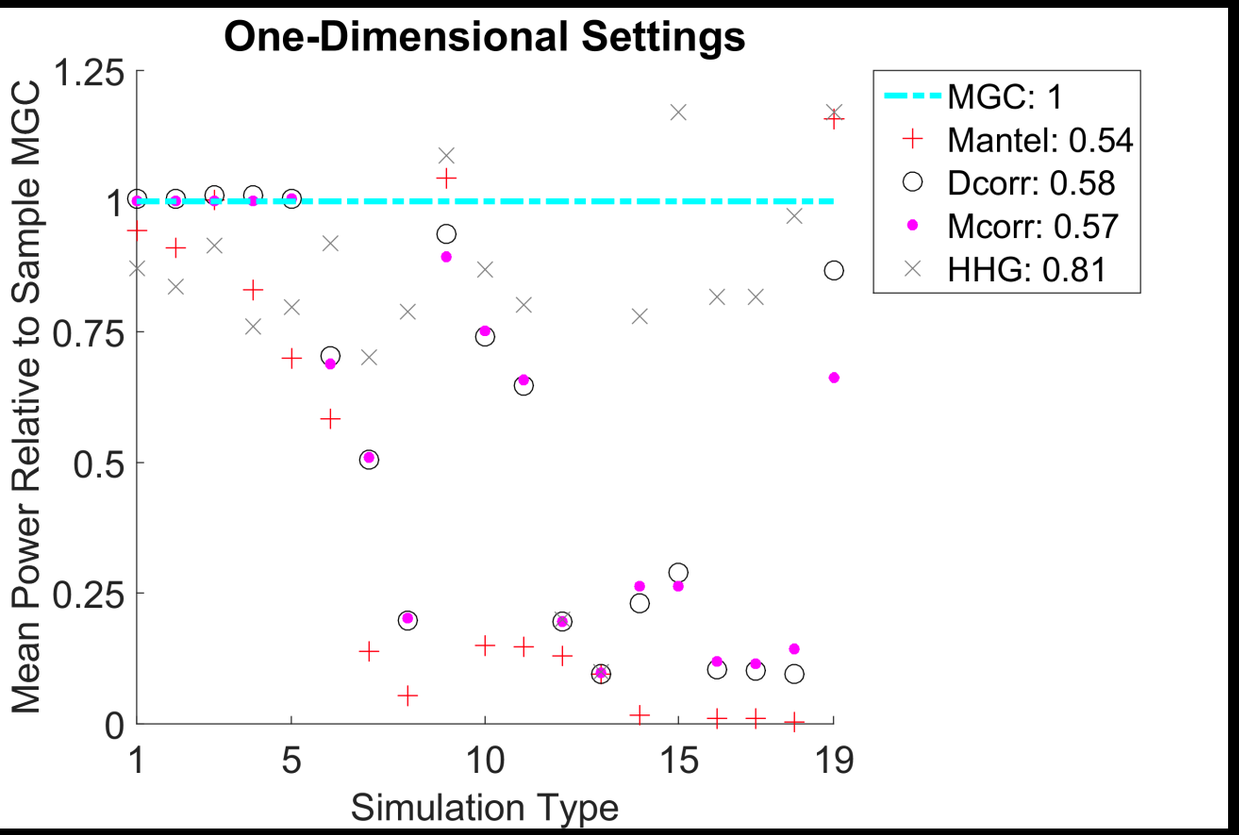
Who Cares?

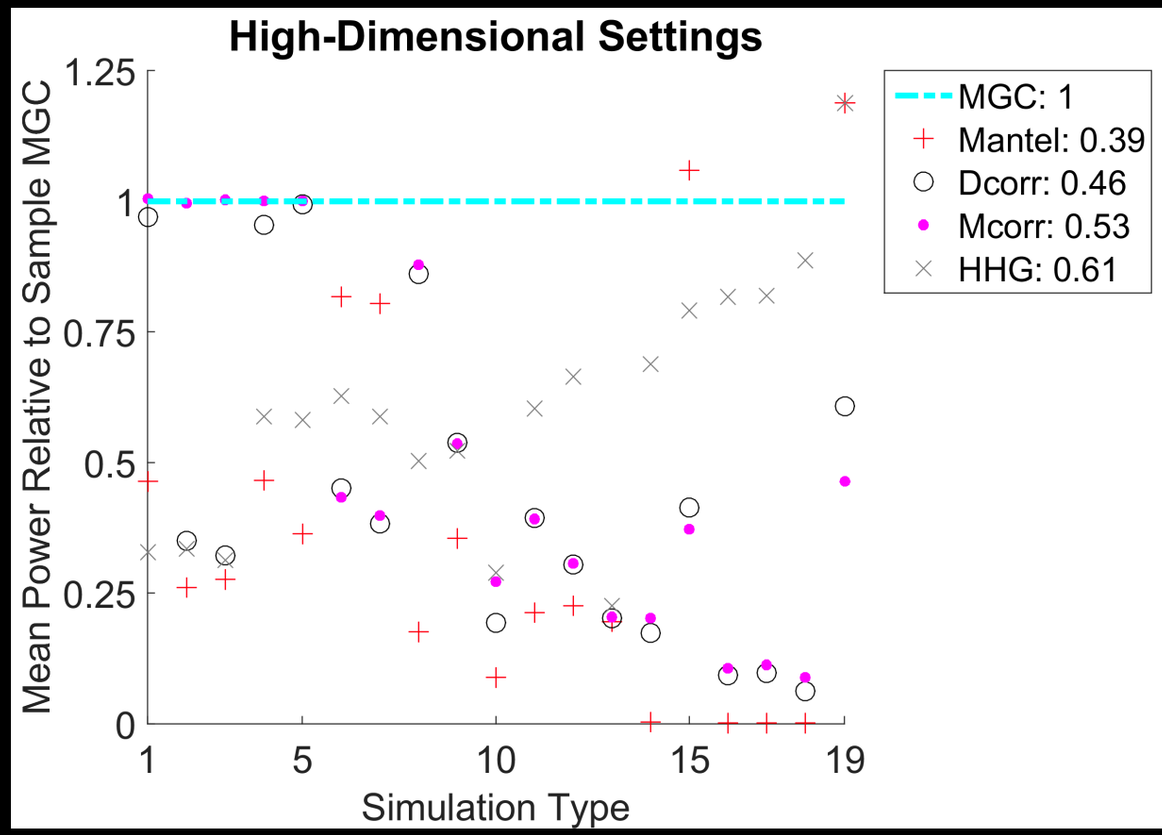
- We expect the methods we have already developed to become the reference approaches for those 3 tasks, and therefore of interest to anybody doing data analysis in high-dimensions.

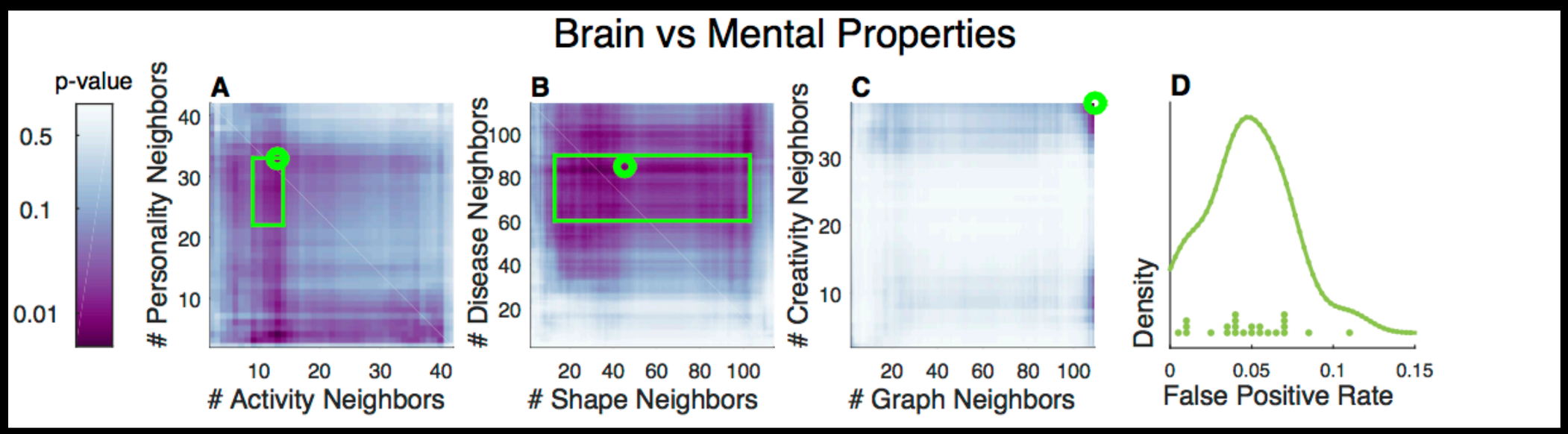
- For the network extensions, we suspect anybody performing analysis on networks with attributes will utilize our work.

[1] Shen et al., 2016, [2] Tomita et al., 2016, [3] Vogelstein et al., 2017.

MGC dominates other dependence tests in theory & practice

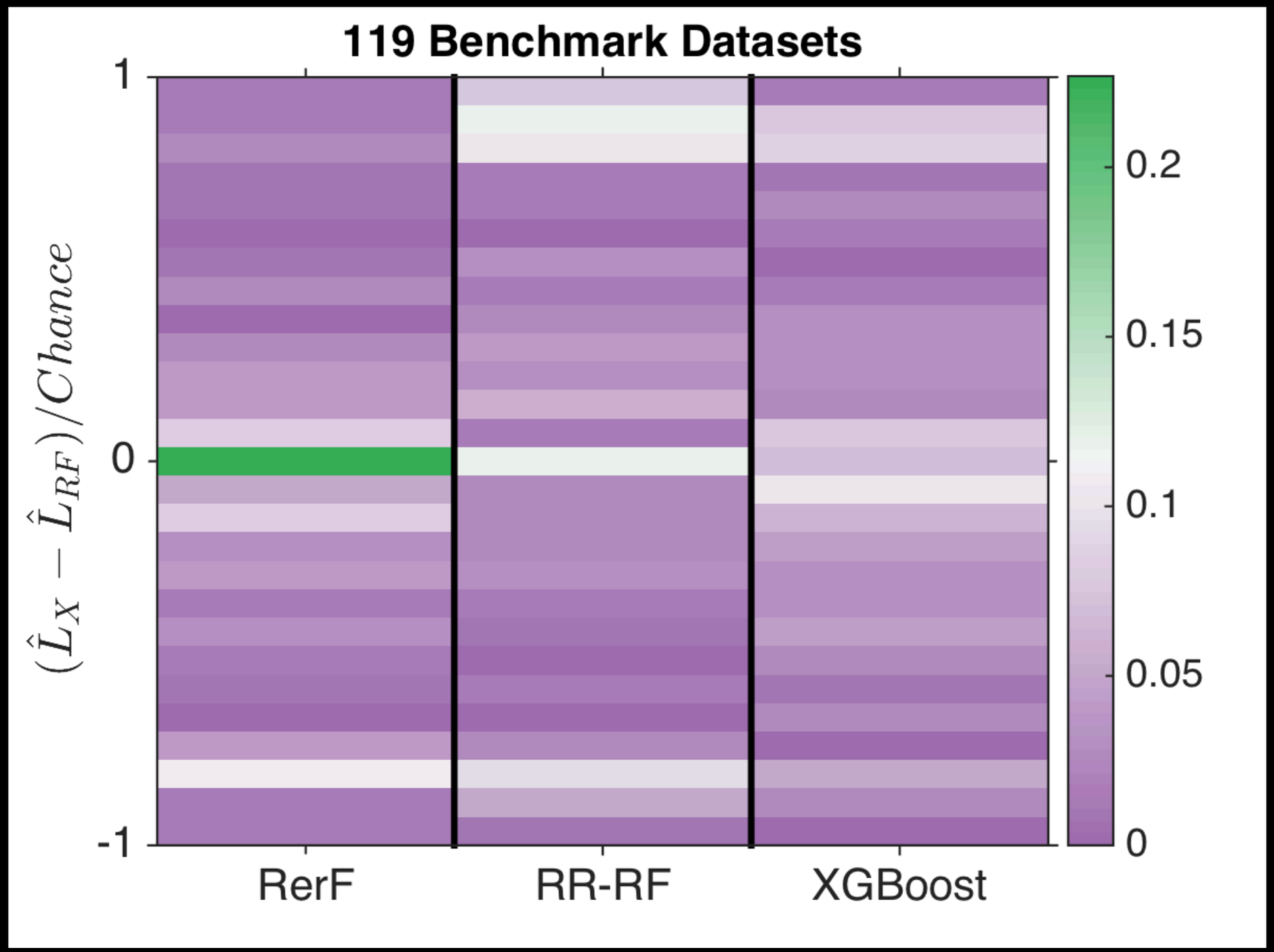






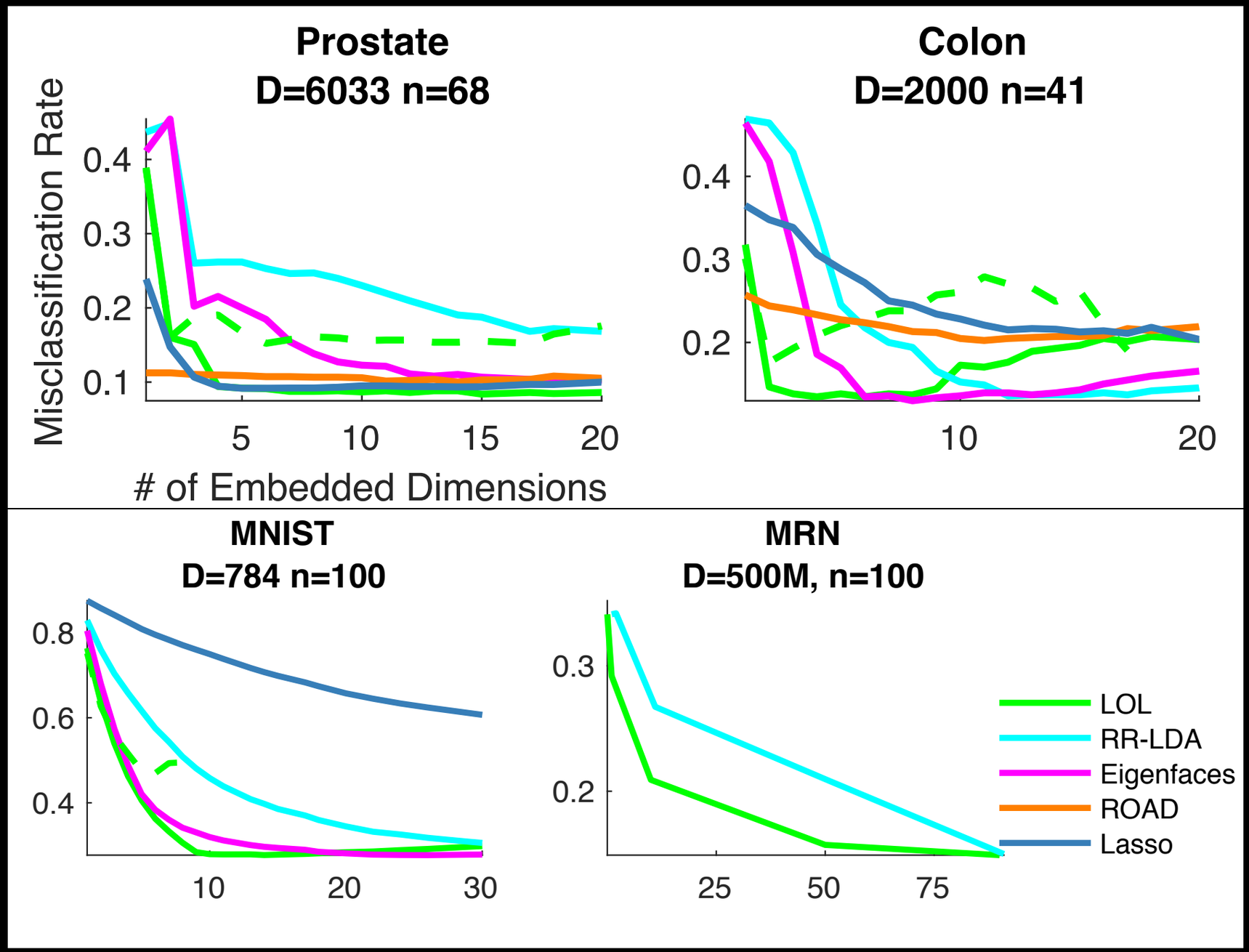
https://arxiv.org/abs/1609.05148

RerF empirically dominates all other ML algs on classification



https://arxiv.org/abs/1506.03410

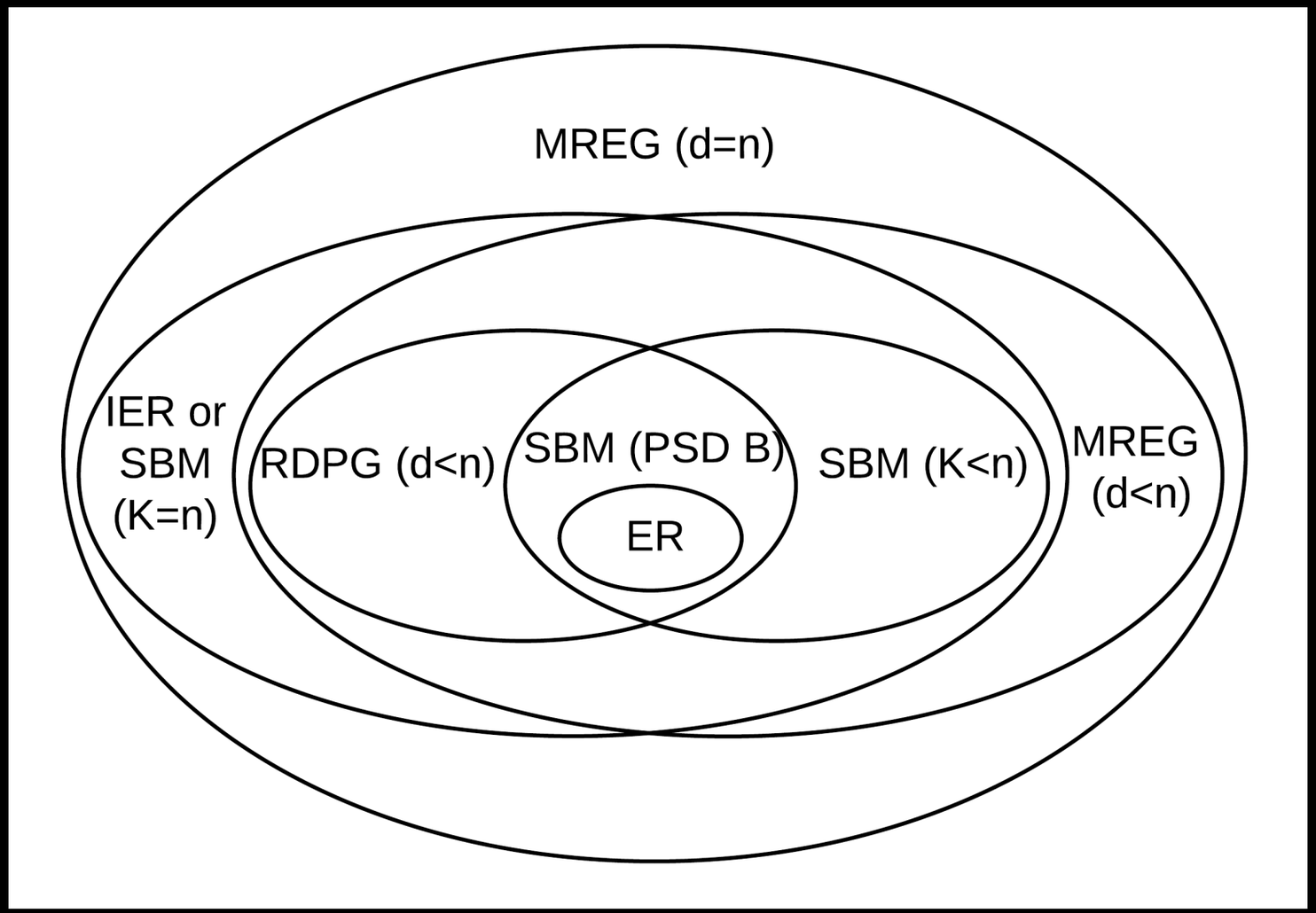
LOL Dominates PCA for subsequent classification in theory and practice



https://github.com/neurodata/LOL/raw/master/Draft/LOL.pdf

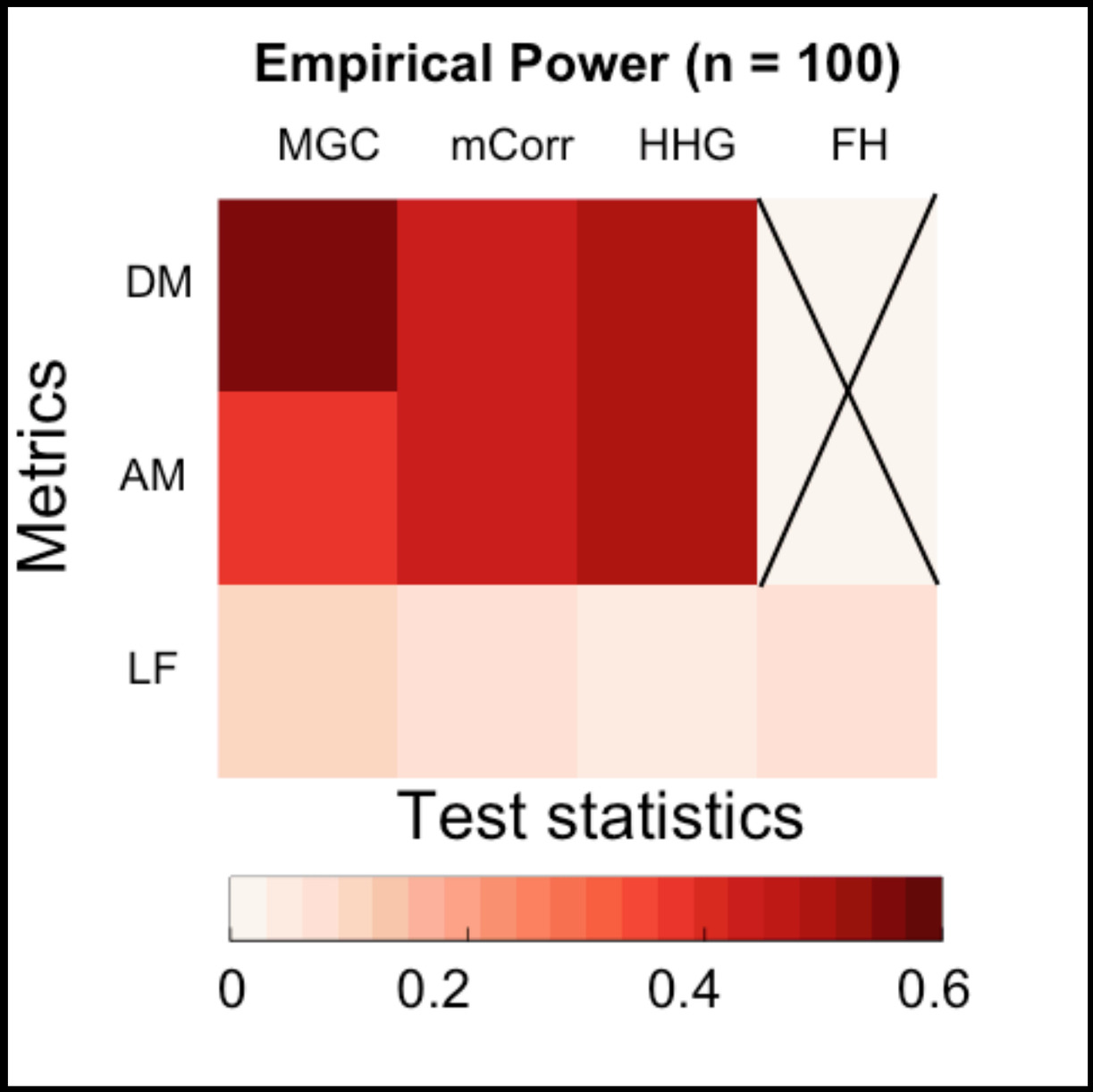
Extensions to Populations of Graphs with Rich Attributes

Joint Model of Multiple Graphs with Subsequent Inference



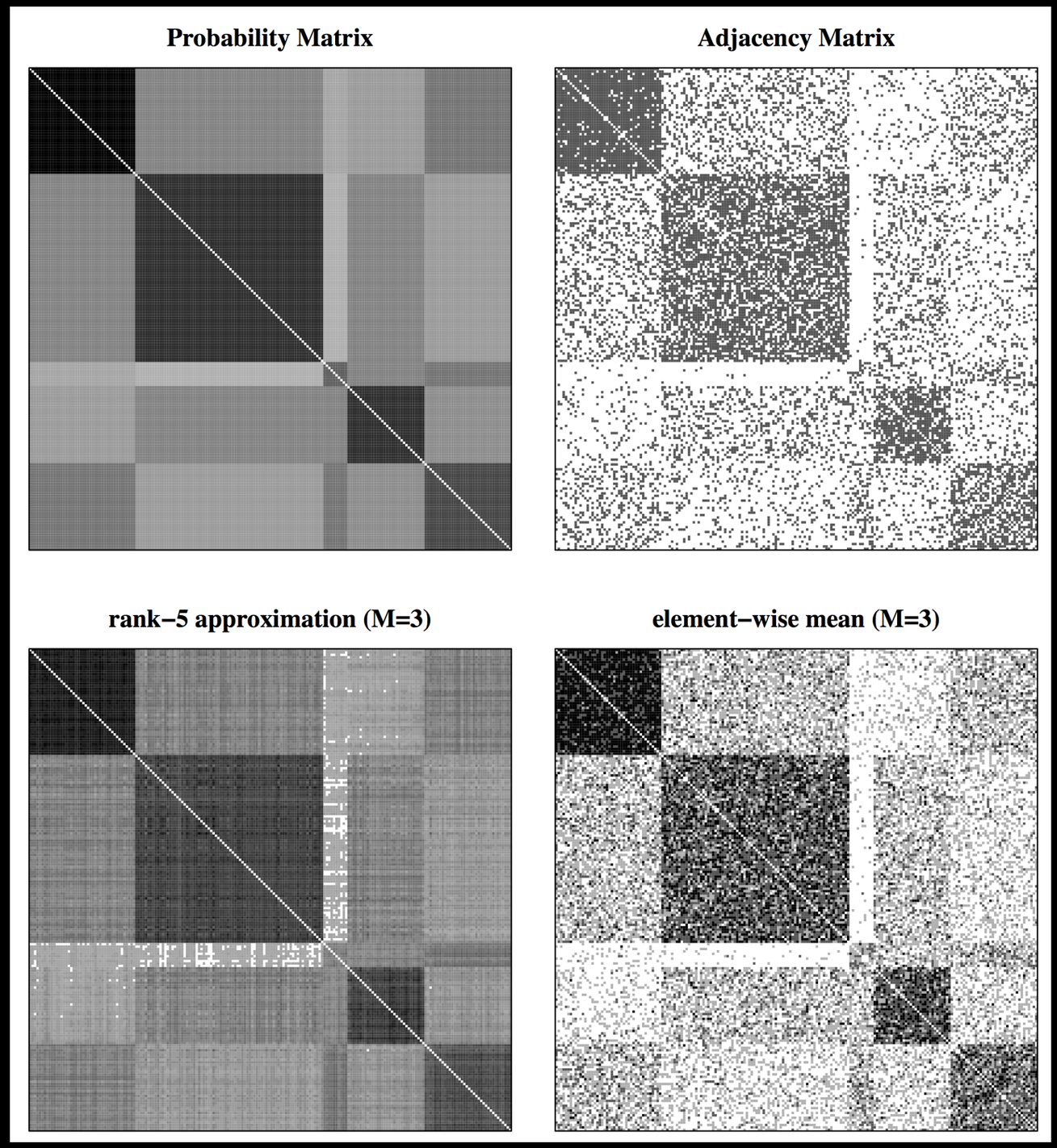
https://arxiv.org/abs/1703.03862

1st Nonparametric Test for Independence of Graphs and Nodal Attributes



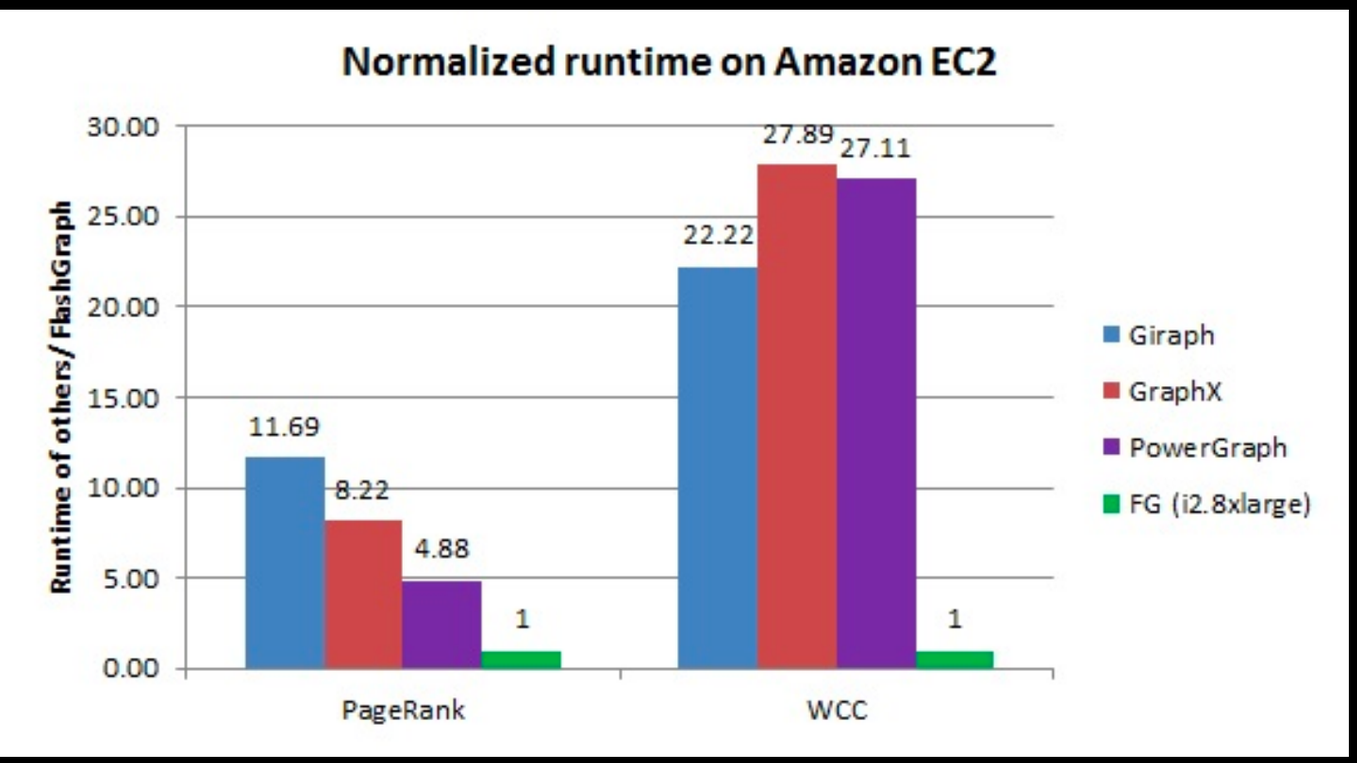
https://arxiv.org/abs/1703.03862

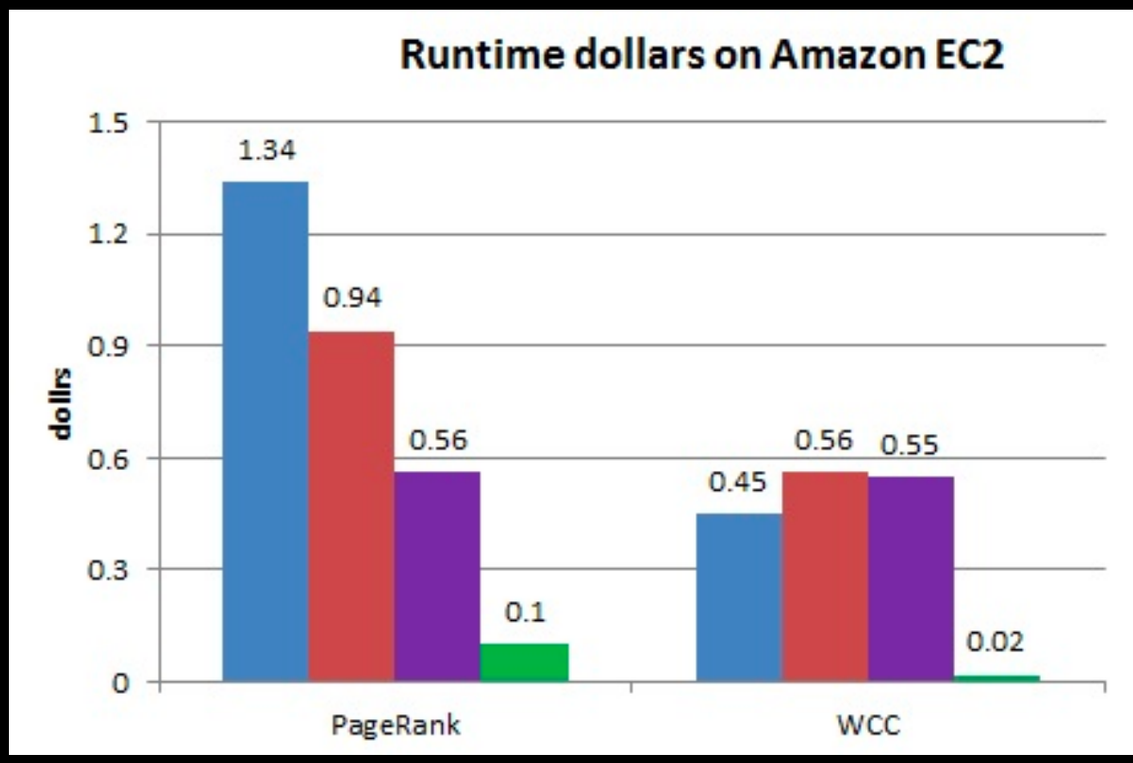
Law of Large Graphs for Estimation of Mean Graph with Low Sample Size



https://arxiv.org/abs/1609.01672

FlashMatrix for ML
on arbitrarily large Graphs and Matrices
using Commodity Machines





https://arxiv.org/abs/1604.06414