I hope this message finds you well. I am writing to you as a former student of Guangdong Technion who is going to arrive Berkeley as a visiting student researcher.

Currently, I have several papers under review with PNAS, and I am working with professors from Berkeley in the process of preparing other manuscripts for submission to PNAS.

I wish to briefly introduce them, the first, titled "Robust estimations from distribution structures: Mean," proposes a novel semiparametric method to derive a robust mean estimator, converging to the median Hodges-Lehmann mean as the optimal semiparametric mean estimator. The second, "Robust estimations from distribution structures: Central Moments," presents a technique for computing central moments robustly and reveal the unimodal structure of the central moment kernel distributions. The third, "Robust estimations from distribution structures: Invariant Moments," presents a near-optimum technique for computing moments robustly, accurately, and efficiently. The fifth, titled "Robust estimations from distribution structures: Nonasymptotic," introduces a method to decompose the randomness structure into several quasi-random variables, which can greatly facilitate the estimation of finite sample bias. The sixth, titled "Matrix dissimilarities based on differences in moments and sparsity," introduces an approach based on differences in moments and sparsity which can delineate the key factors underlying group differences. The seventh, titled "Infer metabolic momentum from moment differences of mass-weighted intensity distributions," introduces an approach to infer the metabolic directions and magnitudes without requiring knowledge of the exact chemical structures of these compounds and their related pathways. The eighth, titled "Taylor's law in omics dataset," introduces the significant role of Taylor's law in omics dataset.

I have learned of your esteemed career and your connection to Technion. Given your expertise in outlier identification, I believe your insights could be invaluable. I am wondering whether you are interested in extending the methods in REDS: Invariant moments to high-dimensional, which is the fourth paper of REDS series. The basic principle is using a method to first identify outliers with two different criteria (e.g., minimum covariance determinant or minimum volume ellipsoid or determinant ratio or Stahel-Donoho outlyingness or the newly proposed entropic outlier sparsification), and then computed the related moments, the d values can be calibrated by a multivariate unimodal distribution. The obtained parameters can be further used to iteratively specify the parameters in the outlying identification algorithms to improve the results. This work is currently leading by Prof. Sandrine Dudoit, Prof. Nikita Zhivotovskiy, and Prof. Song Mei.

Your time and consideration are deeply appreciated. I am eager to receive your insights and perhaps engage in a fruitful collaboration that will enhance the impact of our shared research endeavors.

Sincerely,

Tuobang Li