Emergent Research:
The PIMS Postdoctoral Fellow Seminar

Pacific Institute *for the* Mathematical Sciences

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Optimal transport in statistics and Pitman efficient multivariate distribution-free testing

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ABSTRACT:
In recent years, the problem of optimal transport has received significant attention in statistics and machine learning due to its powerful geometric properties. In this talk, we introduce the optimal transport problem and present concrete applications of this theory in statistics. In particular, we will propose a general framework for distribution-free nonparametric testing in multi-dimensions, based on a notion of "multivariate ranks" defined using the theory of optimal transport. We demonstrate the applicability of this approach by constructing exactly distribution-free tests for testing the equality of two multivariate distributions. We investigate the consistency and asymptotic distributions of these tests, both under the null and local contiguous alternatives. We further study their local power and asymptotic (Pitman) efficiency, and show that a subclass of these tests achieve attractive efficiency lower bounds that mimic the classical efficiency results of Hodges and Lehmann (1956) and Chernoff and Savage (1958).

For more information and registration:
https://www.pims.math.ca/seminars/PIMSPDF

SPEAKER BIO:
Nabarun Deb is a PIMS postdoctoral fellow at UBC, Vancouver. He currently works under the supervision of Young-Heon Kim (UBC), Geoffrey Schiebinger (UBC), and Soumik Pal (UW, Seattle) on optimal transport and its applications in statistics and machine learning. He did his Ph.D. from Columbia University, New York. Nabarun believes research is as much about learning to ask the right questions as it is about finding appropriate answers.

ABOUT PIMS PDF SEMINARS:
PIMS ongoing lecture series featuring our Postdoctoral Fellows every three weeks. You will have the opportunity to connect with emerging research in the mathematical sciences from a PIMS Postdoctoral Fellow. PIMS PDFs are amongst the top young researchers in Canada, and this is an excellent opportunity to learn about them, and their work.