**CANSSI Saskatchewan**

**Health Science Collaborating Centre**

**Winter 2022 Webinar Series**

**Thursday, February 23**

**11 am – 12 pm Central time**

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University of British Columbia

**Gaussian Mixture Reduction based on**

**Composite Transportation Divergence**

**ABSTRACT**

In many applications, researchers wish to approximate a finite Gaussian mixture distribution with a high order by one with a lower order. Examples include density estimation, recursive tracking in hidden Markov model, and belief propagation. A direct solution to such a Gaussian Mixture Reduction problem is computationally challenging due to the non-convexity of commonly employed optimality targets.

One popular line of approach is to employ some clustering-based iterative algorithms. Neither their convergence nor destination, however, are thoroughly discussed. In this paper, we propose a new GMR method by minimizing some novel composite transportation divergence (CTD). This divergence permits an easy to implement Majorization-Minimization (MM) algorithm. We prove that the MM algorithms converge under general conditions, and many existing clustering-based algorithms are special cases of our approach. We further investigate the property of this approach with various choices of cost functions and demonstrate its effectiveness and computational costs.

***Registration link:***

<https://usask-ca.zoom.us/meeting/register/tJMvc-mtpjMtHtaFbYtSo9kK6VYWAkyvN-uh>

*Everyone is welcome!*