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**Wasserstein Stability and Persistent Homology**

**Abstract**

The stability of persistence diagram is one of the cornerstone results in applied topology. However most of the work deals with a particular type of stability called bottleneck stability, which is a bound on the sup-norm of differences. While this is sufficient for some cases - often we would like to consider other distances. A common distance in applications is the p-Wasserstein distance which is a distance based on optimal transport. This is a generalisation of the bottleneck distance and can often be much more useful. For example, in many cases where there is randomness, the maximum difference can diverge to infinity. In this talk I will explain the problem with previous approaches and present a new stability result with a relatively straightforward proof and discuss various applications. Time permitting I will also explain how the general transport distance can fit into an algebraic framework. This is joint work with Katharine Turner (ANU).