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Thesis Bibliography

[1] explains the Helmholtz decomposition that converts ranked data into ordinal data. It provides both the algorithm for the decomposition, as well as three examples of its use. This paper gives sufficient explanation to allow me to apply the Helmholtz decomposition to new datasets and new problems.

[2] explains the mathematical intuition behind homology analysis works, and provides several examples. [2] details the actual algorithm used, which may be useful if I decide to implement it myself. [4] and [5] both provide various examples of the uses of homology analysis, both in detecting underlying structure, and in providing fingerprints that identify different phenomena.

[2] also explains the Mapper tool, and provides examples of its use. I have already used the algorithm described in this paper to analyze several datasets.

[6] describes the intuition behind the laplacian analysis, which I have also implemented.

References

- [1] Jiang, Xiaoye, et al. "Statistical ranking and combinatorial Hodge theory." *Mathematical Programming* 127.1 (2011): 203-244.
- [2] Carlsson, Gunnar. "Topology and data." *Bulletin of the American Mathematical Society* 46.2 (2009): 255-308.
- [3] Zomorodian, Afra, and Gunnar Carlsson. "Computing persistent homology." *Discrete & Computational Geometry* 33.2 (2005): 249-274.
- [4] Giusti, Chad, et al. "Clique topology reveals intrinsic geometric structure in neural correlations." *Proceedings of the National Academy of Sciences* 112.44 (2015): 13455-13460.
- [5] Ulmer, M., Lori Ziegelmeier, and Chad M. Topaz. "Assessing biological models using topological data analysis." *arXiv preprint arXiv:1811.04827* (2018).
- [6] Singh, Gurjeet, Facundo Mmoli, and Gunnar E. Carlsson. "Topological methods for the analysis of high dimensional data sets and 3d object recognition." *SPBG*. 2007.