DIMENSION REDUCTION & MANIFOLD LEARNING

Examination outline

When/Where: See ADE
What: Reading and summarizing a paper. Choose one point to elaborate/develop.
Format: Individual oral presentation, and turn in the "Reading report" sheet.
Duration: 20 minutes for the presentation, 10 minutes for questions.
Support: Free choice (board, slides, or both).
If you use slides, make sure to send them to me by email at least the day before.

Instructions for Choosing the Article

- Select the paper you wish to present for the exam.
- Provide your name and surname and tick the box ✔ corresponding to the column of the chosen article on the following website:

  https://framadate.org/I-Love-Manifolds

- **Note**:
  - Vote for only one article. A vote for more than one article will be deemed invalid and subsequently deleted.
  - Assignment will follow the "first-come, first-served" rule.
- If you have another paper in mind that you would like to read and present for the exam, that is entirely possible, subject to my approval. Send me an email to discuss it.
- Contact me with any questions about the paper you are reading.

List of articles

1. **Random projection trees for vector quantization**
   Dasgupta S. & Freund Y. (link)
   Information Theory, IEEE Transactions on, 55(7):3229–3242, 2009.

2. **Estimating the intrinsic dimension of datasets by a minimal neighborhood information**
   Facco, E., d'Errico, M., Rodriguez, A., & Laio, A. (link)
   Scientific reports, 2017

3. **Isumap: Manifold Learning and Data Visualization leveraging Vietoris-Rips filtrations**
   Barth, L. S., Joharinad, P., Jost, J., & Keck, J. (link)
   arXiv preprint, 2024

4. **Beyond the noise: intrinsic dimension estimation with optimal neighbourhood identification.**
   Di Noia, A., Macocco, I., Glielmo, A., Laio, A., & Mira, A. (link)
   arXiv preprint

5. **On the Convergence of Maximum Variance Unfolding**
   Arias-Castro, E., & Pelletier, B. (link)
   Journal of Machine Learning Research, 2013

6. **Infinite multidimensional scaling for metric measure spaces**
   Kroshnin, A., Stepanov, E., & Trevisan, D. (link)
   ESAIM: Control, Optimisation and Calculus of Variations, 2022

7. **Minimax Estimation of Distances on a Surface and Minimax Manifold Learning in the Isometric-to-Convex Setting**
   Arias-Castro, E., & Alain Chau, P. (link)
   Information and Inference, 2023

8. **A kernel-based analysis of Laplacian Eigenmaps**
   Wahl, M. (link)
   arXiv preprint, 2024

9. **A theory of stratification learning**
   Aamari, E. & Berenfeld, C. (link)
   arXiv preprint, 2024