

# Proposal For Graphics And Visualization Project

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## 1 Problem Statement

Feature identification and matching through persistence diagram and overview visualization of the time step data set.

## 2 List of Features/Algorithms

1. Forming persistence diagram for each step by finding critical points.
2. Matching 2 consecutive persistence pair diagram using Kuhn Munkres algorithm.
3. Distance used between 2 consecutive persistence diagram is Waaserstein's distance.

## References

- [1] 508 time steps, OW criterion for vorticity. [Online]. Available: [https://indianinstituteofscience-my.sharepoint.com/:f:/r/personal/raghavendrag\\_iisc\\_ac\\_in/Documents/VS3D?csf=1&web=1e=Wd8FWD](https://indianinstituteofscience-my.sharepoint.com/:f:/r/personal/raghavendrag_iisc_ac_in/Documents/VS3D?csf=1&web=1e=Wd8FWD)
- [2] International CFD Database, <http://cfd.cineca.it/>. [Online]. Available: <http://cfd.cineca.it/>
- [3] J. Munkres, "Algorithms for the assignment and transportation problems," *Journal of the Society of Industrial and Applied Mathematics*, vol. 5, no. 1, pp. 32–38, March 1957.
- [4] M. Soler, M. Plainchault, B. Conche, and J. Tierny, "Lifted wasserstein matcher for fast and robust topology tracking," *CoRR*, vol. abs/1808.05870, 2018. [Online]. Available: <http://arxiv.org/abs/1808.05870>