## Proposal For Graphics And Visualization Project

Rohit Prasad, Lakhan Malviya, Ichchhit Baranwal

November 15, 2021

## 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
- [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