CS732/DS732: Data Visualization -- Datathon 2
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Announcement: September 11, 2020, 11:59 pm IST
Submission: September 21, 2020, 11:59 pm IST on LMS

Dataset:
Source and description: 5-day moving average of values computed of Indian Ocean from the ocean model MOM, run by the Indian National Center for Ocean Information Services, INCOIS, Hyderabad. The data source is https://las.incois.gov.in/las/UI.vm under "Ocean Analysis" and "Indian Ocean (5-day upto last 10 days)" -- "Temperature and Salinity" and "Zonal and Meridional Currents". Available at:
https://iiitbac-my.sharepoint.com/:f:/g/personal/jnair_iiitb_ac_in/EgBNN0NF0hdKiKjwXeHd7MYBldqeI-W4UwuWRwvmDKxH7A?e=a71jJm
or https://tinyurl.com/yxrtdp28

Metadata: The dataset consists of 4 folders, each for different variables, namely, salinity, potential temperature, meridional current, and zonal current, commonly during the period November 2004 – January 2005, i.e. 18 time steps. The datasets are at 5-day interval. Each of the folders also has a screenshot of the web-page giving latitude-longitude ranges of each variable. Additional timesteps covering December 2003- December 2005 are provided for salinity and potential temperature, i.e. 147 time steps. Each folder has a .png image which provides the latitude-longitude range in the file.

The 3D datasets contain depth values starting from 5 m to 225 m, with 10 m interval.

Indicative Tasks:
Generate **two** new scalar fields of 3D volumes with the available fields and visualize them using isosurfaces and slicing. *(Remember we have 4D data with 4 attributes here. Hence, the 3D data can also be 2D+1D in space and time.)*

Slicing to observe depth profiles (i.e. x-z and y-z planes) is useful. Slicing can also be done to observe interesting patterns in x-y plane, or spatio-temporal planes (x-t, y-t, z-t).

A few hints:

- find spatio-temporal patterns related to ocean phenomena, e.g. tsunami, etc.
- use multivariate statistical measures, and scalar values of vector fields.
- ***use your inferences from datathon-1, as much as you can.***
- ***compute statistical descriptors in different slices before actually evaluating slices or subvolumes for visualization. e.g. most of the important ocean phenomena occur closer to the sea-surface. Below 225m, the observations at the live server are given in non-uniform and larger intervals, indicating the slower rates of change when going below 225m.***
- ***be as creative and as curious as you can.***

Report:
Your report must contain images and text to say the following;
1. which parts of the dataset were you able to use, and how have you been able to use – the more you use the merrier.

2. which visualizations did you choose, why, what technologies (Python libraries, others) did you use for the visualizations,
3. your inferences.