GISTDA Ocean Current Prediction (AI Model)

Deep Autoregressive Networks (LSTM and Transformer) for Ocean Current Model

Description

This Python script allows you to predict ocean currents based on different models. You can specify the model, date, hour, latitude, and longitude as command line arguments.

Usage

1. **Install Dependencies**:

   ```bash
   pip install -r requirements.txt
   ```

2. **Run the Script**:

   To predict ocean currents, use the following command line arguments:

   - `--model`: Choose the ocean current classifier. Options: "None", "GI21-Model", "GI31-Model", "GI41-Model", "GULF3-Model", "GULF4-Model", "GULF-Model".
   - `--date`: Specify the date for ocean current prediction in YYYY-MM-DD format.

- `--hour`: Specify the hour to start prediction (0-23).
- `--latitude`: Specify the latitude for prediction.
- `--longitude`: Specify the longitude for prediction.

Examples:

- **Example 1**: Predict ocean currents using "GULF3-Model" for latitude 12.1146134 and longitude 100.8672236 on December 7, 2022, starting at hour 5.

```bash
python ocean_current_prediction.py --model "GULF3-Model" --date "2022-12-7" --hour 5 --latitude 12.1146134 --longitude 100.8672236
```

- **Example 2**: Predict ocean currents using "GI41-Model" for latitude 10.0 and longitude 100.0 on September 20, 2023, starting at hour 14.

```bash
python ocean_current_prediction.py --model "GI41-Model" --date "2023-09-20" --hour 14 --latitude 10.0 --longitude 100.0
```

- **Example 3**: Predict ocean currents without specifying a model (None) for latitude 8.0 and longitude 102.0 on January 1, 2023, starting at hour 9.

```bash
python ocean_current_prediction.py --model "None" --date "2023-01-01" --hour 9 --latitude 8.0 --longitude 102.0
```

- **Example 4**: Predict ocean currents using "GULF-Model" for latitude 9.5 and longitude 101.5 on November 15, 2022, starting at hour 16.

```bash
python ocean_current_prediction.py --model "GULF-Model" --date "2022-11-15" --hour 16 --latitude 9.5 --longitude 101.5
```

- **Example 5:** Predict ocean currents using "GI31-Model" for latitude 11.0 and longitude 100.5 on April 5, 2023, starting at hour 12.

```bash
python ocean_current_prediction.py --model "GI31-Model" --date "2023-04-05" --hour 12 --latitude 11.0 --longitude 100.5
```

3. **View Results**:

The script will provide predictions for ocean currents based on your input parameters. The results will be displayed in the console.

You can save this **README** in your project's root directory to provide clear instructions on how to run the code with various examples.