Ocean Project - Getting Started Guide

Welcome to the Ocean Project! This guide will help you get hands-on experience with ocean data processing and deep learning techniques.

📋 Project Overview

This project consists of three interconnected tasks that will take you through the complete pipeline of ocean data processing, from raw data handling to advanced machine learning applications.

🚀 Tasks

Task 1: CNN-Based Super Resolution

Objective: Build and train a Convolutional Neural Network for super resolution tasks

What you'll learn:

- Data loading and preprocessing techniques
- Custom training loop implementation
- CNN architecture design for image enhancement

Repository: Task1_CNN_superResolution

Task 2: Visualization and Performance Metrics

Objective: Develop comprehensive visualization tools and evaluation metrics

What you'll learn:

- Result visualization best practices
- Performance metric calculation and interpretation
- Data analysis and presentation techniques

Repository: visualization_and_metric

Task 3: Data Processing Pipeline

Objective: Transform raw oceanographic data into machine learning-ready formats

What you'll learn:

- Processing `.nc` (NetCDF) files
- Converting data to `.h5` (HDF5) format for general use
- Creating `.tar` archives optimized for super resolution tasks

Repository: dataProcess_demo

📚 Prerequisites

- **Python**: Basic to intermediate knowledge
- **PyTorch**: Familiarity recommended
- New to PyTorch? Start with the official PyTorch tutorial
- **Data Science**: Basic understanding of data processing concepts

🎯 Getting Started

1. **Follow the sequential order** (Task 1 → Task 2 → Task 3) for optimal learning
2. **Read the documentation** in each repository carefully

3. **Experiment and modify** the code to deepen your understanding

💡 Tips for Success

- Take your time with each task - understanding is more important than speed
- Don’t hesitate to explore the code and experiment with different parameters
- Document your findings and learnings as you progress

🤝 Contributing & Feedback

We value your input! If you have:

- Suggestions for improvements
- Questions about the tasks
- Ideas for additional features

Please feel free to reach out

Happy coding, and enjoy your journey into ocean data science! 🌊