Plan Overview

A Data Management Plan created using DMPTool

DMP ID: https://doi.org/10.48321/D1235H

Title: DMP for "Optimal transport based strategies in waves and dynamics"

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Template: Department of Defense (DOD)

Project abstract:

The project, led by Cornell University and in collaboration with the New Jersey Institute of Technology, focuses on advancing the field of optimal transport. The main goal is to harness the power of optimal transport theory to capture the intrinsic characteristics of complex physical processes arising in a wide range of important scientific applications. We will tackle a fundamental problem in the theory: its inability to handle signed signals arising in models of wave propagation and dynamic processes. The theoretical components of the proposed work aim to (1)
prove the ideal properties of the new metric designed explicitly for signed signals and its relation to the optimal transport theory; (2) investigate gradient methods driven by optimal transport-based metrics in global optimization; (3) harness the power of the optimal push-forward maps from the transport-based geometry to model nonlinear dynamics and develop a robust approximation theory that ensures provable convergence in learning approaches. The computational components of the project will involve a numerical investigation of the performance of the new optimization techniques and an in-depth exploration of these methods in several application areas, including image processing, multiscale modeling, and inversion, modeling dynamic processes, and deep learning.

Start date: 07-01-2024

End date: 06-30-2027

Last modified: 01-18-2024

Copyright information:

DMP for "Optimal transport based strategies in waves and dynamics"

This project will produce publications, quantitative data, as well as documented code in the following formats: images, websites, video files, reports, MATLAB files, Jupyter notebooks, text files. The data are characterized as observational, derived, simulated, and/or other. The data types referenced include data generated by computer, data collected from sensors or instruments, images, audio files, video files, reports, publicly available on websites and/or other. The data are not of a sensitive nature.

The data will be stored in the following common formats: .txt, .mat, .pdf, .mov, .avi, .mp4, .mat., and .html websites. The types of metadata that will be included are .txt Read me files, which conform to the standards in this field. Manuscripts submitted for publication will have preprints stored on public repositories that generate metadata. When applicable, the Dublin Core/XML Generic standard will be used for documentation, images, multimedia.

Data will be stored on GitHub, Comet.ml, NJIT and Cornell campus networks, and PI and participant workstations. Ethical and privacy issues including HIPAA and IRB are not applicable. There will not be any restrictions placed on the data.

Data will be made available on or after the first year of the project, and the PI anticipates that preprints and curriculum materials will be publicly available after the second year of the project. Foreseeable users of the data are academics, students, the general public. Data re-use and re-distribution will not be limited, subject to appropriate citation

The DMP will utilize physical and cyber resources to preserve and store research data effectively. Here are the critical aspects of the plan:

Physical storage: Project personnel will maintain notebooks for raw or hand-recorded data in their respective offices. These notebooks and included data will be supported by specific personnel and stored securely. Additionally, department staff will electronically scan the notebooks annually for electronic archiving on the university server, providing an additional layer of backup protection.

Data retention assessment: The DMP recognizes the importance of identifying data that must be retained or destroyed for contractual, legal, or regulatory purposes. Consulting with legal and regulatory experts is essential to determine the appropriate retention period for different data types, considering the specific project requirements and applicable regulations.

Value assessment: The DMP acknowledges the need to assess the value of data beyond the current project. Data with potential uses in future research, follow-up studies, replication studies, or meta-analyses should be considered for long-term retention. In addition, the worth of data to the project and other researchers or institutions should be evaluated to inform decisions about managing and sharing the data.

Long-term preservation plan: The DMP outlines a plan for long-term preservation, aiming to maintain all raw data, analyzed data, reports, books, and publications. The data will be preserved permanently, adhering to the minimum retention period of three years from the end of any federal award period or three years from the date of public release.

Selection of data repositories or archives: The DMP emphasizes the importance of selecting reputable and secure data repositories or archives capable of preserving the data for the required duration. The chosen repository or archive should also be accessible and compatible with future technologies. Consideration of associated costs, such

as data deposition, curation, or long-term storage fees, will be factored into the decision-making process.

Preparation for sharing and preservation: The DMP recognizes the need for proper data preparation to facilitate sharing and protection. This involves data cleaning, documentation, formatting to conform to standard guidelines, and including relevant metadata. In addition, adequate allocation of resources and time will be ensured to ensure that the data is properly preserved and accessible to those who need it in accordance with the DOD Public Access Plan in February 2015.

By addressing these aspects, the DMP outlines the physical and cyber resources and facilities used for data storage and preservation and the strategies for long-term retention and accessibility of the research data.

The DMP acknowledges the need for the OSTP Memorandum[1] August 25, 2022, digitally formatted scientific data resulting from unclassified, publicly releasable research supported wholly or in part by DoD funding should be stored and publicly accessible to search, retrieve, and analyzed to the extent feasible and consistent with applicable law and policy; agency mission; resource constraints; and U.S. national, homeland, and economic security.

[1] https://www.whitehouse.gov/wp-content/uploads/2022/08/08-2022-OSTP-Public-Access-Memo.pdf

N/A

Planned Research Outputs

Text - "TBD"

Planned research output details

Title	Type	Anticipated release date	Initial access level	Intended repository(ies)	Anticipated file size	License	Metadata standard(s)	May contain sensitive data?	May contain PII?
TBD	Text	2024-12-21	Open	National Science Digital Library	5 MB	Custom Data Use Agreements/Terms of Use	Dublin Core	No	No