



LECTURE 6

GEOSPATIAL EMBEDDING REPRESENTATIONS: EXPLICIT, IMPLICIT, HYBRID, AND INTERPRETABLE

Geospatial Representation Learning

PRESS – OR SPACE. →

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Learning Outcomes

Lecture

- Compare explicit geospatial embeddings, embedding databases, location encoders, and implicit neural representations.
- Explain how geospatial embeddings can serve as compact proxies for raw geodata in downstream applications.
- Identify applications of geospatial embedding representations in prediction, retrieval, interpolation, monitoring, and environmental analysis.
- Describe hybrid approaches that combine explicit embeddings, implicit models, raw data access, and retrieval-augmented generation.
- Explain how geospatial information can be distributed across databases, model parameters, retrieval systems, and prompts.
- Apply basic interpretability concepts for embeddings, including cosine similarity, nearest-neighbor analysis, PCA, and linear probing.

Lab

- Prepare a small spatiotemporal geospatial dataset for representation learning.
- Implement or use a simple coordinate-based neural representation.
- Evaluate interpolation or reconstruction quality across space and/or time.
- Analyze continuous neural representations compared to discrete raster-based approaches.



PRACTICAL 6

LEARNING A SPATIOTEMPORAL REPRESENTATION

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