From self-supervision to trustworthy EO foundation models

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Abstract
Earth observation is changing fast. In the past, every task needed its own dataset and model. Now, foundation models trained with self-supervised methods promise to capture shared patterns across sensors, regions, and scales. This shift could make EO analysis more flexible and less dependent on expensive labels. But it also raises hard questions. How far can a single model generalize? What happens when we apply it to new places or unseen modalities? And most importantly—can we measure when the model is uncertain? In this talk, I will share recent progress on foundation models for EO, focusing on self-supervised learning and zero-shot uncertainty estimation. Beyond benchmarks and accuracy scores, the goal is to understand how these models can become reliable tools for science and applications, while keeping an eye on their current limits and open challenges.

Declaration on Generative AI

The author(s) have not employed any Generative AI tools.

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