AUTOMATING EARTH OBSERVATION ANALYTICS PIPELINES WITH AGENT RAVEN

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ABSTRACT

Efficient integration of vector databases, such as those containing administrative boundaries and land parcels, with remote sensing images is essential for various Earth Observation (EO) applications. Zonal statistics (ZS) offer a powerful tool for this purpose, but their computation remains challenging due to fragmented system interfaces, diverse preprocessing needs, and inconsistent performance across systems. Current methods optimize execution within single systems but lack support for dynamic, cross-system workflows. To address this, we present Agent Raven, the first AI-driven multi-agent system designed to autonomously manage the full lifecycle of ZS computation and deployment. Building on the Raven framework, Agent Raven dynamically selects execution backends, optimizes query pipelines, and adaptively manages workflows based on previous experiments. Our work represents a step forward in intelligent orchestration across heterogeneous systems in EO data analytics.

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