Illuminating the Darkness: Exploiting Untapped Data and Information Resources in Earth Science

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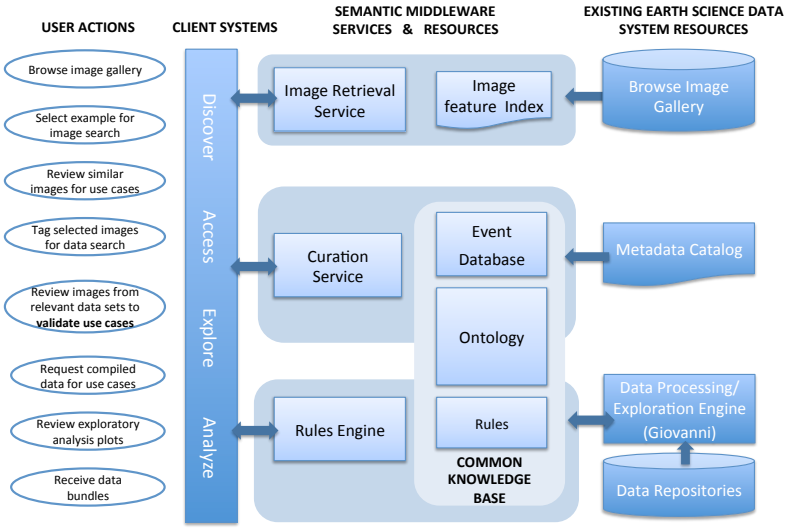
Objective

- Develop Semantic Middle Layer (SML) software to exploit existing information resources to:
  - allow visual search capability for events or phenomena in Earth science imagery
  - find data relevant to an event, phenomenon, or topic of interest by utilizing structured metadata and descriptive text
  - produce curated data albums and exploratory analytical plots on the fly
- Integrate data discovery and exploration processes for structured and free-form text and imagery
- Demonstrate utility of the SML using Event Nexus prototype for three science scenarios



High Level Architecture with Middleware

Accomplishments

- Implemented re-usable services (data curation and rule engine) for event study
- Developed image retrieval/classification based services and applications: browse image retrieval, phenomena identification, hurricane wind speed estimation and dust climatology
- Prepared a parameter mapping service for mapping Earth science keywords to data granule fields.
- Developed a prototype event explorer tool that demonstrates end-to-end capabilities of developed components for event study on three use cases: dust storms, volcanic eruptions, tropical storms
  - Example: Upon browsing images of volcanic eruptions, tool identifies relevant physical features (e.g., lava flow), measurements (e.g., surface temperature), and data fields (e.g., MODIS surface temperature variables in region of interest)
- Built a search and discovery demonstration tool

Co-Is/Partners:

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$TRL_{in} = 2$ $TRL_{out} = 4$