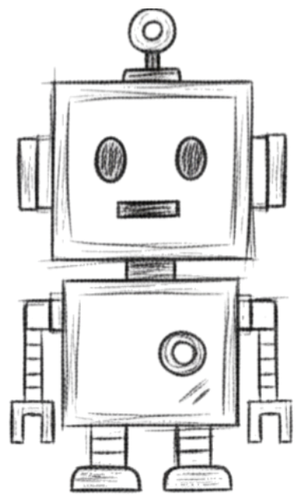
STRUCTURED AI AGENTS for Reliable Visualization Report Generation



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HIGHLIGHTS

- **Clean & Correct Data**
  By performing **case normalization** and data cleaning, we achieved correct and consistent Top-K extraction.
- **Reliable Metrics**
  All quantitative results are deterministically computed, **eliminating AI-induced hallucinations**.
- **Structured Report**
  Our report generation pipeline organizes results into **structured sections**, improving readability and consistency.
- **Efficient Generation**
  Our pipeline completes within about **15 seconds**, enabling efficient and responsive visualization generation.

METHODOLOGY

1. Structured AI Agent Design

We decompose agent into multiple structured sub-task units:

- **Overview**
- **Temporal Trends**
- **Top Entities**
- **Cross-Metric Relationships**

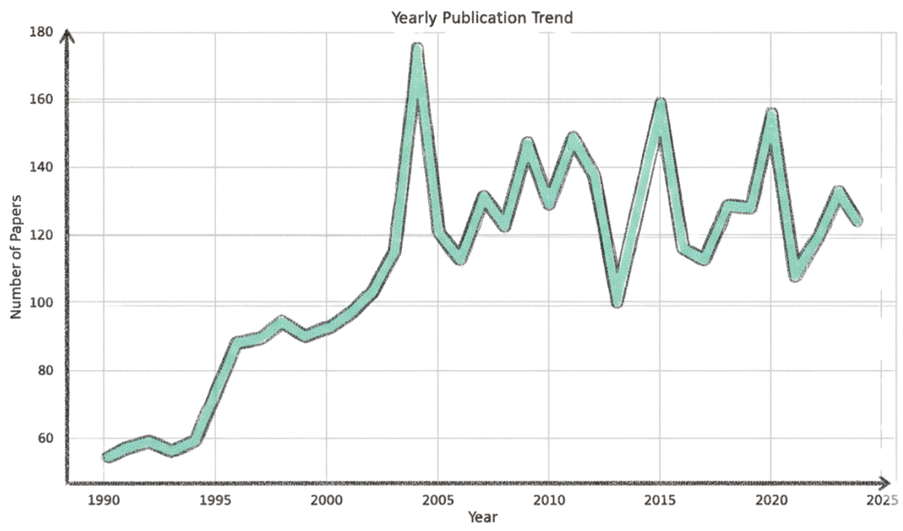
2. Structured LLM Output

```
{
"section": "<section>",
"title": "<short title>",
"goal": "<2–3 sentences>",
"description_template":
"<1–2 sentences with {placeholders}
computed by METRICS>",
"narrative_only": <true|false>,
"compute_only_code": "
<python>",
"code": "<python code>"
}
```

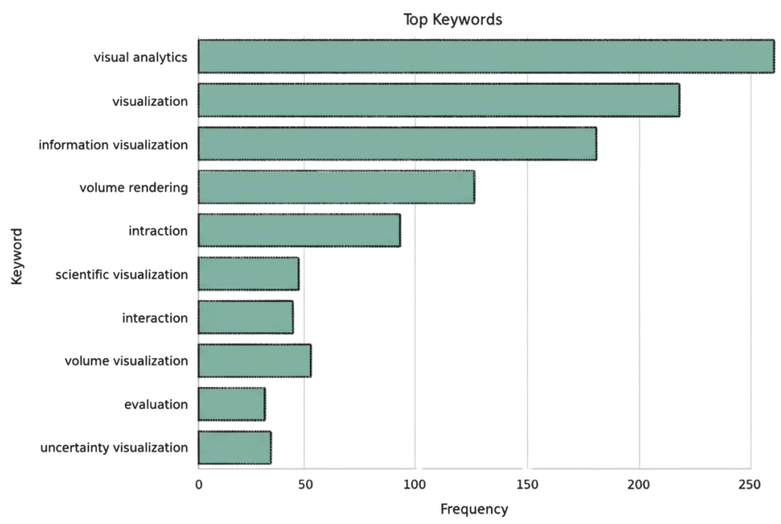
3. Execution & Report Composition

Integrates verified data, charts, and text into a **readable and reliable** visualization report.

RESULTS



Yearly Publication Trend:
All numerical values are deterministically computed, eliminating AI-induced errors.



Top Keywords:
Case normalization prevents common counting errors caused by inconsistent capitalization.

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