Given a billion-node graph, like a who-follows-whom Twitter graph, how do we summarize its patterns, spot anomalies, and visualize it? Meet OPAvion, a scalable graph mining system, with three modules:

- **Summarization** (Pegasus)
- **Anomaly Detection** (OddBall)
- **Visualization** (Apolo)

**Summarization**

Pegasus (award-winning)

Operates off-line on billion-node, disk-resident graphs and computes statistics, like PageRank, connected components, degree distribution, triangles, etc.

**Anomaly Detection**

OddBall (award-winning)

Uses graph statistics to mine patterns and spot anomalies, such as nodes with many contacts but few interactions with them (possibly telemarketers).

**Visualization**

Apolo

Allows users to incrementally explore the graph, starting with their chosen nodes or the flagged anomalous nodes; then users can expand to the nodes’ vicinities, label them into categories, and interactively navigate to other relevant parts of the graph.