BERICO TECHNOLOGIES
IMPACT THROUGH INNOVATION

CLAVIN

CAPABILITIES OVERVIEW

CLAVIN

CARTOGRAPHIC LOCATION AND VICINITY INDEXER

CLAVIN is an **open source** software package for document geotagging and **geoparsing**. It automatically extracts location names from unstructured text and resolves them against a gazetteer to produce data-rich geographic entities. It's fast, accurate, and scales to accommodate **big data** in the cloud.

CLAVIN combines various open source tools with natural language processing techniques to extract and resolve geospatial entities from text, intelligently and automatically. It handles misspellings, alternate names, and ambiguous references like "Springfield" or "Portland."

By enriching documents with structured geo data, CLAVIN enables advanced geospatial analytics on **unstructured** text.

To download the source code, or try out the interactive online demo, please visit:
clavin.bericotechnologies.com

CLAVIN enables advanced geospatial analytics on unstructured big data

The CLAVIN Advantage:

Accurate: 75% accuracy for exact entity resolution (precision: 0.739, recall: 0.767, F-measure: 0.753)

Fast: resolves 100 locations per second per CPU

Scalable: processes 1M documents containing 5.7M locations in under 1 hour on a 9-node Hadoop cluster

Easy-to-use: simple API (Java .jar + gazetteer data)

Smart: uses natural language processing (NLP), fuzzy matching, & context-based heuristics

Versatile: enables advanced geospatial analytics, map visualizations, & hierarchical geospatial search

Open source: zero licensing costs (Apache License)

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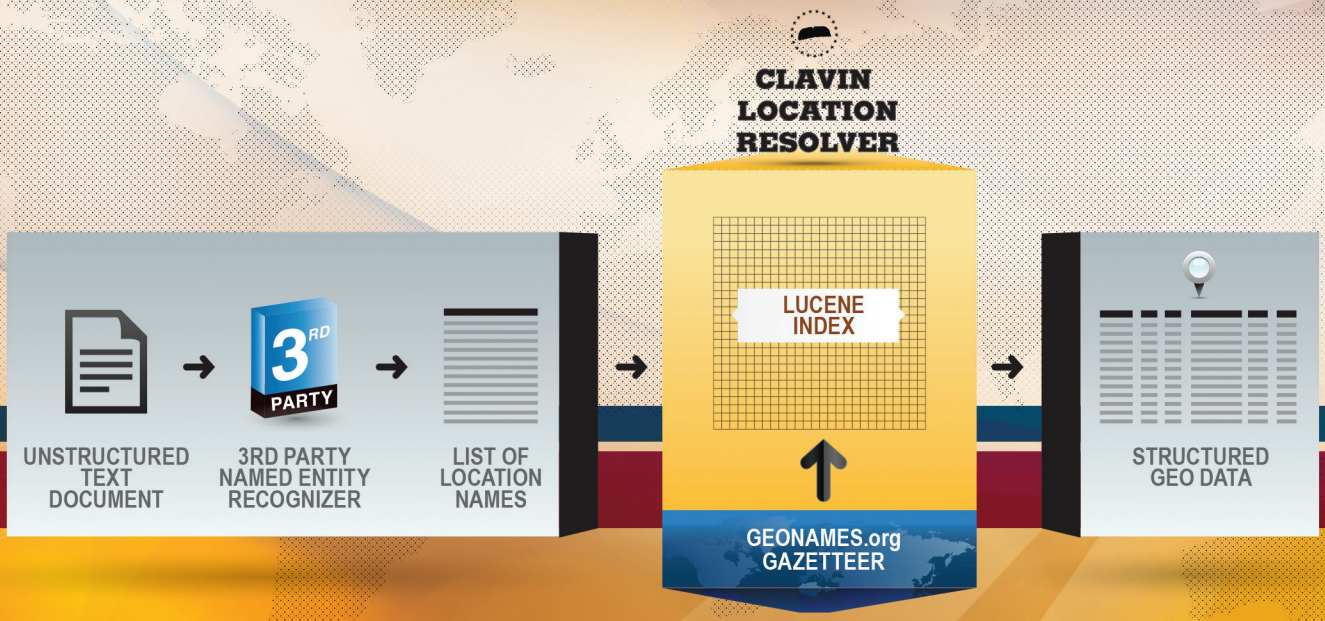

System Architecture

The system diagram shown above, provides a general overview of the processing workflow in CLAVIN. Input to the system is a completely unstructured text document. First, a list of location names is extracted from the text by a third-party named entity recognition tool, such as Apache OpenNLP Name Finder or Stanford NER. This list is passed to the CLAVIN location resolver, which then compares the location names against an Apache Lucene index built from the GeoNames.org gazetteer. CLAVIN selects the most appropriate matches for these location names based on the surrounding context of the document, and returns data-rich geographic entities representing the locations mentioned in the text. These entities contain a variety of data attributes (including lat/lon coordinates, country codes, administrative subdivisions, alternative names, population, elevation, etc.) that can be used to facilitate geospatial search and analytics.

Advanced Features

CLAVIN utilizes a variety of **natural language processing** (NLP) techniques to derive geo data from unstructured text. **Named entity recognition** distinguishes "Grover Cleveland" from a city in Ohio, while **fuzzy matching** is used to capture misspelled location names, including phonetic spelling and typographical errors. CLAVIN recognizes alternate names for the same entity (e.g., "Ivory Coast" and "Côte d'Ivoire"), and intelligently disambiguates between ambiguous location names like "Springfield" based on the **semantic context**.

Using the GeoNames.org geographic database as its data source allows CLAVIN to have **worldwide coverage** spanning dozens of gazetteers consisting of well over 8 million locations and over 15 million unique location names.

Building CLAVIN from open source technologies and releasing it under the Apache License allows Berico to deliver these powerful capabilities with **zero licensing cost.**

OPEN SOURCE + BIG DATA

In October 2012, CLAVIN was released to the public under the **Apache License** as Berico's first official open source project. This means CLAVIN can be deployed to as many Hadoop nodes as required to fit your **big data** needs without having to worry about expensive enterprise licenses or costly usage fees.

We'd love to help you **unlock** the geospatial potential of your unstructured data by tailoring a custom solution based on CLAVIN. Contact us today at **clavin@bericotechnologies.com**

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