AlchemyAPI™

Case Study
CEBRA

AlchemyAPI Augments Research for Centre of Excellence for Biosecurity Risk Analysis

Mining online strategic intelligence to prevent the spread of disease

Biologists and statisticians at the University of Melbourne are determined to prevent the spread of pests and diseases carried by plants, animals, goods and people. Governments, farmers, veterinarians and doctors can more effectively minimize fatalities and reduce the impact on global trade when they know the source and path of disease transmission, so communication is one of the most effective weapons in the battle.

The Challenge: Real-time discovery, sharing of biosecurity information

Identifying and sharing data on infections requires daily Google queries and rigorous monitoring for mentions of tainted products or outbreaks in RSS feeds, search engines, industry journals and Twitter.

To support their mission, university and government researchers launched the International Biosecurity Intelligence System (IBIS). IBIS is a Web 2.0 intelligence network for plant and animal (aquatic and terrestrial) biosecurity that is devoted to collecting and organizing information used to track and forecast diseases as well as follow emerging disease trends. The university's Centre of Excellence for Biosecurity Risk Analysis (CEBRA) uses IBIS to "develop the practice of risk analysis by creating and testing methods, protocols, analytical tools and procedures to benefit both government and the broader Australian community."[1]

Attempting to collect strategic intelligence about pest and disease outbreaks around the world via manual online research is time-consuming, laborious, irregular, and impractical to achieve with the necessary frequency, breadth and depth of content analysis. The need for an automated system therefore became apparent, and a prototype, www.aquatichealth.net, was developed for tracking aquatic animal pests and diseases. However, the prototype could only scan English language articles about aquatic animal health.

cebra
Centre of Excellence for Biosecurity Risk Analysis

Company Profile:
- Research university

NLP Problems:
- Manual search time-intensive and not comprehensive
- Context, author and location extraction needed

AlchemyAPIs Used:
- Named entity extraction
- Text extraction
- Language detection

Volume of Content Analyzed:
- Over 6,000 unique items/day

Type of Data Analyzed:
- Text

Result:
- 206 RSS feeds monitored/day
- 283 separate Google queries/day
- Real-time information collection, archiving
- Reliable resource for proactive disease control

The Solution: AlchemyAPI's text extraction, language detection and named entity extraction

The university engaged web developer Shaun Moss to enrich the limited search and content analysis capabilities the first version of IBIS possessed. Moss's first step was to review the code for IBIS and he found that AlchemyAPI's services were a key part of the prototype application. The researcher who first developed IBIS (Aidan Lyon, University of Maryland) had evaluated several NLP providers and decided that AlchemyAPI was the best option. Following Lyon's lead, Moss looked to AlchemyAPI for NLP services that would further enhance IBIS into a resource that users could count on for the latest biosecurity information.

Two hundred eighty three distinct search queries are now sent to Google each day, resulting in approximately 6,000 transactions on IBIS. These searches are all related to biosecurity; for example: "dead fish," "avian influenza" and "EMS in Indonesian shrimp" are included in those daily queries, if they are current topics of interest. IBIS also checks more than 200 RSS feeds for new articles. The top 20 results for each query and any new URLs are added to the results queue for processing. That processing is executed by calling:

- URLGetAuthor
- URLGetLanguage
- URLGetRankedNamedEntities
- URLGetRawText
- URLGetText
- URLGetTitle

Each processed article becomes a new "node" in the IBIS database. The node includes the original article title and text, the translated title and text (Google Translate is used when the original language is not English), the author and the location. Geonames is used to convert place names found by AlchemyAPI into lat/long coordinates. The body of the article is also scanned for context, such as the pests or diseases that are mentioned, and tagged accordingly.

AlchemyAPI's Value: Excellent situational awareness and competitive edge

"AlchemyAPI is an invaluable part of IBIS and enables us to more effectively achieve our objectives," says Moss. "The software gives biosecurity researchers much more up-to-date, real time intelligence than what they have had in the past."

AlchemyAPI also gives CEBRA a competitive edge when it comes to securing research funding. IBIS continually strengthens its proof-of-concept as the number

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of users grows and shared information limits disease impact. These tangible results influence allocation of increasingly scarce financial backing.

Has IBIS made a difference? Geoff Grossel, aquatic health biosecurity researcher at the Australian Department of Agriculture and the lead designer of the system, can point to many successful outcomes for users. For example, the Philippines government enacted border control measures that stopped the entry of Early Mortality Syndrome (EMS) into aquatic resources. It has shown that EMS did not migrate to Indonesia in 2013. And it predicts that sea lice, a pathogen that attacks salmon, will dominate headlines in Scottish aquaculture in 2015.

Conclusion

IBIS is a robust program that helps to monitor infectious diseases outbreak and transmission in plants and animals. Thanks to AlchemyAPI's integration into the program, it is now able to identify and publish more relevant insight on each mention of an infection. This allows CEBRA and government agencies to take proactive measures that safeguard public health and limit economic damage on global trade.

About AlchemyAPI

The product of over 75 person years of engineering effort, AlchemyAPI is a text mining platform providing the most comprehensive set of semantic analysis capabilities in the natural language processing field. Used over 3 billion times every month, AlchemyAPI enables customers to perform large-scale social media monitoring, target advertisements more effectively, track influencers and sentiment within the media, automate content aggregation and recommendation, make more informed stock trading decisions, enhance business and government intelligence systems, and create smarter applications and services. To learn more about our company and services, please call us at 1-877-253-0308 or email info@alchemyapi.com.

1. http://cebra.unimelb.edu.au/about