# NEW! – Franz's AllegroGraph 7 Powers First Distributed Semantic Knowledge Graph Solution with Federated-Sharding

*FedShard™, Entity-Event Data Modeling and Browser-based Gruff Drives Infinite Data Integration, Holistic Insights and Complex Reasoning*

Franz Inc., an early innovator in Artificial Intelligence (AI) and leading supplier of Semantic Graph Database technology for Knowledge Graph Solutions, today announced AllegroGraph 7, a breakthrough solution that allows infinite data integration through a patented approach unifying all data and siloed knowledge into an Entity-Event Knowledge Graph solution that can support massive big data analytics. AllegroGraph 7 utilizes unique federated sharding capabilities that drive 360-degree insights and enable complex reasoning across a distributed Knowledge Graph. Hidden connections in data are revealed to AllegroGraph 7 users through a new browser-based version of Gruff, an advanced visualization and graphical query builder.

"Large enterprises have Knowledge Graphs that are so big that no amount of vertical scaling will work," said Jans Aasman, CEO of Franz Inc. "When these organizations want to conduct new big data analytics, it requires a new effort by the IT department to gather semi-usable data for the data scientists, which can cost millions of dollars, waste valuable time and still not provide a holistic data architecture for querying across all data. ETL, Data Lakes and Property Graphs only exacerbate the problem by creating new data silos.

AllegroGraph 7 takes a holistic approach to mixed data, unifying all enterprise data with domain knowledge, including taxonomies, ontologies and industry knowledge – making queries across all data possible, while simplifying and accelerating feature extraction for machine learning."

To support ubiquitous AI, a Knowledge Graph system will have to fuse and integrate data, not just in representation, but in context (ontologies, metadata, domain knowledge, terminology systems), and time (temporal relationships between components of data). The rich functional and contextual integration of multi-modal, predictive modeling and artificial intelligence is what distinguishes AllegroGraph 7 as a modern, scalable, enterprise analytic platform. AllegroGraph 7 is the first big temporal knowledge graph technology that encapsulates a novel entity-event model natively integrated with domain ontologies and metadata, and dynamic ways of setting the analytics lens on all entities in the system (patient, person, devices, transactions, events, and operations) as prime objects that can be the focus of an analytic (AI, ML, DL) process.

AI applications and complex reasoning analytics require information from both databases and knowledge bases that contain domain information, taxonomies and ontologies in order to conduct queries. Some large-scale knowledge bases cannot be sharded because they contain highly interconnected data. AllegroGraph 7 federates any shard with any large-scale knowledge base – providing a novel way to shard knowledge bases without duplicating knowledge bases in every shard. This approach creates a modern analytic system that integrates data in context (ontologies, metadata, domain knowledge, terminology systems) and time (temporal relationships between components of data). The result is a rich functional and contextual integration of data suitable for large scale analytics, predictive modeling, and artificial intelligence.

Financial institutions, healthcare providers, contact centers, manufacturing firms, government agencies and other large

enterprises that use AllegroGraph 7 gain a holistic, future-proofed Knowledge Graph architecture for big data predictive analytics and machine learning across complex knowledge bases.

"AllegroGraph 7's support of Entity-Event Data Modeling is the most welcome innovation and addition to our arsenal in reimagining healthcare and implementing Precision Medicine," said Dr. Parsa Mirhaji, Director of Center for Health Data Innovations at the Albert Einstein College of Medicine and Montefiore Health System, NY "Precision Medicine is about moving away from statistical averages and broad-based patterns. It is about connecting many dots, from different contexts and throughout time, to support precision diagnosis and to recommend the precision care that can take into account all the subtle differences and nuisances of individuals and their personal experiences throughout their life. This technology is about saving lives, by leveraging data, context and analytics and is what Franz's Entity-Event Data Modeling brings to the table."

Dr. Mirhaji and his team at Montefiore Health System have developed the Patient-centered Analytic Learning Machine (PALM) using these capabilities to provide an enterprise platform for Artificial Intelligence and machine learning in healthcare that can support conversational AI, interpret data from EMR, natural language, and radiological images, all centered around life-time experiences of an individual patient. A single system that unifies all analytics and data from heterogeneous sources to manage appointments and prescriptions, triage patients with potential spinal cancer, respiratory failure, or sepsis, and provide just-in-time recommendations and personalized decision support for clinicians to improve patients' outcomes.

**Key capabilities in AllegroGraph 7 include:**

**Semantic Entity-Event Data Modeling**

Big Data predictive analytics requires a new data model approach that unifies typical enterprise data with knowledge bases such as taxonomies, ontologies, industry terms and other domain knowledge. The Entity-Event Data Model utilized by AllegroGraph 7 puts core 'entities' such as customers, patients, students or people of interest at the center and then collects several layers of knowledge related to the entity as 'events.' The events represent activities that transpire in a temporal context. Using this novel data model approach, organizations gain a holistic view of customers, patients, students or important entities and the ability to discover deep connections, uncover new patterns and attain explainable results.

## *FedShard™* Speeds Complex Queries

Through a patented in-memory federation function, the results from each machine are combined so that the query process appears as if only one database is being accessed, although many different databases and data stores and knowledge bases are actually being accessed and returning results. This unique data federation capability accelerates results for highly complex queries across highly distributed data sets and knowledge bases.

## Large-scale Mixed Data Processing

The AllegroGraph 7 big data processing system is able to scale massive amounts of domain knowledge data by efficiently associating domain knowledge with partitioned data through shardable graphs on clusters of machines. AllegroGraph 7 efficiently combines partitioned data with domain knowledge through an innovative process that keeps as much of the data in RAM as possible to speed data access and fully utilize the processors of the query servers.

## Browser-based Gruff
Gruff's powerful query and visualization capabilities are now

available via a web browser and directly integrated in AllegroGraph 7. Gruff is the industry's leading Knowledge Graph visualization tool that dynamically displays visual graphs and related links. Gruff's 'Time Machine' provides users with an important capability to explore temporal connections and see how relationships are created over time. Users can build visual graphs that display the relationships in graph databases, display tables of properties, manage queries, connect to SPARQL Endpoints, and build SPARQL or Prolog queries as visual diagrams. Gruff can be downloaded separately or is included with the AllegroGraph v7 distribution.

**High Performance Big Data Analytics**

AllegroGraph 7 delivers high performance analytics by overcoming data processing issues related to disk versus memory access, uses processor core efficiency and updates domain knowledge databases across partitioned data systems in a highly efficient manner.

Gartner predicts "the application of graph processing and graph DBMSs will grow at 100 percent annually through 2022 to continuously accelerate data preparation and enable more complex and adaptive data science." In addition, Gartner named graph analytics as a "Top 10 Data and Analytics Trend" to solve critical business priorities." (*Source: Gartner, Top 10 Data and Analytics Trends, November 5, 2019)*

**AllegroGraph 7 Availability**

AllegroGraph 7 is immediately available directly from Franz Inc.  Visit the AllegroGraph YouTube channel to see AllegroGraph in action.

**Join AllegroGraph 7 Webinar**
Franz Inc. will host a webcast entitled "Scalable Knowledge Graphs Using the New Distributed AllegroGraph 7."  Register for the Webinar.

**Knowledge Graph Conference — May 4 — 7, 2020**

Dr. Jans Aasman, CEO, Franz Inc., will be presenting a talk at the Knowledge Graph Conference entitled, "The Knowledge Graph that Listens" on May 7th at 1PM Eastern. Register for the Conference.

**The Knowledge Graph Cookbook**

Released April 22, 2020, this new book directs readers on why and how to build Knowledge Graphs that help enterprises use data to innovate, create value and increase revenue. The book is full of recipes and knowledge on the subject and features an interview with Dr. Jans Aasman, CEO, Franz Inc. in the Expert Opinion section.  Get a copy of the book.

# Natural Language Processing and Machine Learning in AllegroGraph

The majority of our customers build Knowledge Graphs with Natural Language and Machine learning components. Because of this trend AllegroGraph now offers strong support for the use of Natural Language Processing and Machine learning.

Franz Inc has a team of NLP engineers and Taxonomy experts that can help with building turn-key solutions. In general however, our customers already have some expertise in house. In those cases we train customers in how to take the output of

NLP and ML processing and turn that into an efficient Knowledge Graph based on best practices in the industry.

This document primarily describes the NLP and ML plug-in AllegroGraph.

Note that many enterprises already have a data science team with NLP experts that use modern open source NLP tools like Spacy, Gensim or Polyglot, or Machine Learning based NLP tools like BERT and Scikit-Learn. In another blog about Document Handling we describe a pipeline of how to deal with NLP in Document Knowledge Graphs by using our NLP and ML plugin and mix that with open source tools.

**PlugIn features for Natural Language Processing and Machine Learning in AllegroGraph.**

Here is the outline of the plugin features that we are going to describe in more detail.

*Machine learning*

- data acquisition
- classifier training
- feature extraction support
- performance analysis
- model persistence

*NLP*

- handling languages
- handling dictionaries
- tokenization
- entity extraction
- Sentiment analysis
- basic pattern matching

*SPARQL Access*

- Future development

## Machine Learning

### ML: Data Acquisition

Given that the NLP and ML functions operate within AllegroGraph, after loading the plugins, data acquisition can be performed directly from the triple-store, which drastically simplifies the data scientist workflow. However, if the data is not in AllegroGraph yet we can also import it directly from ten formats of triples or we can use our additional capabilities to import from CSV/JSON/JSON-LD.

Part of the Data Acquisition is also that we need to pre-process the data for training so we provide these three functions:

- prepare-training-data
- split-dev-test
- equalize (for resampling)

### Machine Learning: Classifiers

- Currently we provide simple linear classifiers. In case there's a need for neural net or other advanced classifiers, those can be integrated on-demand.
- We also provide support for online learning (online machine learning is an ML method in which data becomes available in a sequential order and is used to update the best predictor for future data at each step, as opposed to batch learning techniques which generate the best predictor by learning on the entire training data set at once). This feature is useful for many real-world data sets that are constantly updated.
- The default classifiers available are Averaged Perceptron and AROW

### Machine Learning: Feature Extraction

Each classifier is expecting a vector of features: either feature indices (indicative features) or pairs of numbers (index – value). These are obtained in a two-step process:

   1. A classifier-specific extract-features method should be defined that will return raw feature vector with features identified by strings of the following form: prefix|feature.

The prefix should be provided as a keyword argument to the collect-features method call, and it is used to distinguish similar features from different sources (for instance, for distinct predicates).

   2. Those features will be automatically transformed to unique integer ids. The resulting feature vector of indicator features may look like the following: #(1 123 2999 …)

Note that these features may be persisted to AllegroGraph for repeated re-use (e.g. for experimenting with classifier hyperparameter tuning or different classification models).

Many possible features may be extracted from data, but there is a set of common ones, such as:

   1. individual tokens of the text field
   2. ngrams (of a specified order) of the text field
   3. presence of a token in a specific dictionary (like, the dictionary of slang words)
   4. presence/value of a certain predicate for the subject of the current triple
   5. length of the text

And in case the user has a need for special types of tokens we can write specific token methods, here is an example (in Lisp) that produces an indicator feature of a presence of emojis in the text:

```
(defmethod collect-features ((method (eql :emoji)) toks &key
pred)
(dolist (tok toks)
(when (some #'(lambda (code)
  (or (<= #x1F600 code #x1F64F)
      (<= #x1F650 code #x1F67F)
      (<= #x1F680 code #x1F6FF)))
    (map 'vector #'char-code tok))
(return (list "emoji")))))
```

## Machine Learning: Integration with Spacy

The NLP and ML community invents new features and capabilities at an incredible speed. Way faster than any database company can keep up with. So why not embrace that? Whenever we need something that we don't have in AllegroGraph yet we can call out to Spacy or any other external NLP tool. Here is an example of using feature extraction from Spacy to collect indicator features of the text dependency parse relations:

```
(defmethod collect-features ((method (eql :dep)) deps &key
pred dep-type dep-labels)
 (loop :for ds :in deps :nconc
  (loop :for dep :in ds
   :when (and (member (dep-tag dep) dep-labels)
              (dep-head dep)
              (dep-tok dep))
    :collect (format nil "dep|~a|~a_~a"
              dep-type
              (tok-word (dep-head dep)
              (tok-word (dep-tok dep)))))))
```

The demonstrated integration uses Spacy Docker instance and its HTTP API.

## Machine Learning: Classifier Analysis

We provide all the basic tools and metrics for classifier quality analysis:

- accuracy
- f1, precision, recall
- confusion matrix
- and an aggregated classification report

## Machine Learning: Model Persistence

The idea behind model persistence is that all the data can be stored in AllegroGraph, including features and classifier models. AllegroGraph stores classifiers directly as triples. This is a far more robust and language-independent approach than currently popular among data scientists reliance on Python pickle files. For the storage we provide a basic triple-based format, so it is also possible to interchange the models using standard RDF data formats.

The biggest advantage of this approach is that when adding text to AllegroGraph we don't have to move the data externally to perform the classification but can keep the whole pipeline entirely internal.

## Natural Language Procession (NLP)

## NLP: Language Packs

Most of the NLP tools are language-dependent: i.e. there's a general function that uses language-specific model/rules/etc. In AllegroGraph, support for particular languages is provided on-demand and all the language-specific is grouped in the so called "language pack" or langpack, for short — a directory with a number of text and binary files with predefined names.

Currently, the langpack for English is provided at nlp/langs/en.zip, with the following files:

- contractions.txt — a dictionary of contractions

- abbrs.txt — a dictionary of abbreviations
- stopwords.txt — a dictionary of stopwords
- pos-dict.txt — positive sentiment words
- neg-dict.txt — negative sentiment words
- word-tok.txt — a list of word tokenization rules

Additionally, we use a general dictionary, a word-form dictionary (obtained from Wiktionary), and custom lexicons.

Loading a langpack for a particular language is performed using load-langpack.

Creating a langpack is just a matter of adding the properly named files to the directory and can be done manually. The names of the files should correspond to the names of the dictionary variables that will be filled by the pack. The dictionaries that don't have a corresponding file will be just skipped. We have just finished creating a langpack for Spanish and it will be published soon. In case you need other dictionaries we use our AG/Spacy infrastructure. Spacy recently added a comprehensive list of new languages:
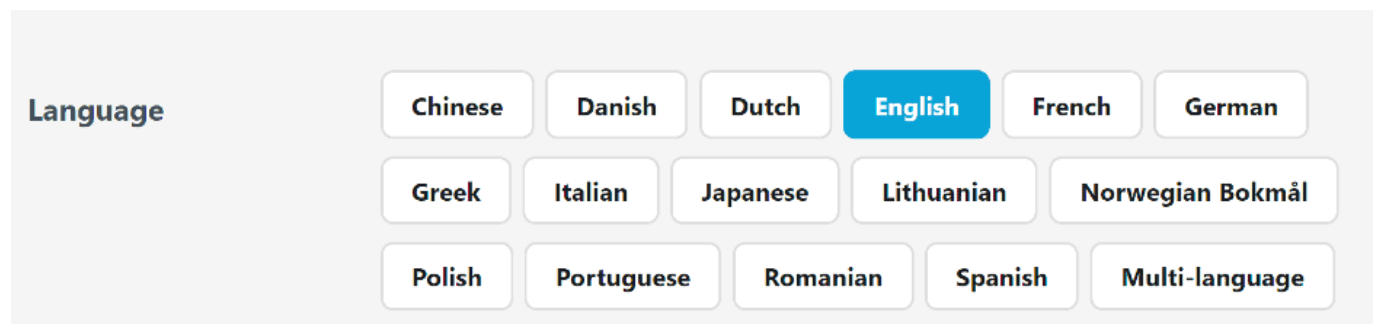


## NLP: Dictionaries

Dictionaries are read from the language packs or other sources and are kept in memory as language-specific hash-tables. Alongside support for storing the dictionaries as text files, there are also utilities for working with them as triples and putting them into the triple store.

Note that we at Franz Inc specialize in Taxonomy Building using various commercial taxonomy building tools. All these tools can now export these taxonomies as a mix of SKOS taxonomies and OWL. We have several functions to read directly from these SKOS taxonomies and turn them into dictionaries that support efficient phrase-level lookup.

**NLP: Tokenization**

Tokenization is performed using a time-proven rule-based approach. There are 3 levels of tokenization that have both a corresponding specific utility function and an :output format of the tokenize function:

> :parags — splits the text into a list of lists of tokens for paragraphs and sentences in each paragraph
> :sents — splits the text into a list of tokens for each sentence
> :words — splits the text into a plain list of tokens

Paragraph-level tokenization considers newlines as paragraph delimiters. Sentence-level tokenization is geared towards western-style writing that uses dot and other punctuation marks to delimit sentences. It is, currently, hard-coded, but if the need arises, additional handling may be added for other writing systems. Word-level tokenization is performed using a language-specific set of rules.

**NLP: Entity Extraction**

Entity extraction is performed by efficient matching (exactly or fuzzy) of the token sequences to the existing dictionary structure.

It is expected that the entities come from the triple store and there's a special utility function that builds lookup dictionaries from all the triples of the repository identified by certain graphs that have a skos:prefLabel or skos:altLabel property. The lookup may be case-insensitive with the

exception of abbreviations (default) or case-sensitive.

Similar to entity extraction, there's also support for spotting sentiment words. It is performed using the positive/negative words dictionaries from the langpack.

One feature that we needed to develop for our customers is 'heuristic entity extraction' . In case you want to extract complicated product names from text or call-center conversations between customers and agents you run into the problem that it becomes very expensive to develop altLabels in a taxonomy tool. We created special software to facilitate the automatic creation of altlabels.

## NLP: Basic Pattern Matching for relationship and event detection

Getting entities out of text is now well understood and supported by the software community. However, to find complex concepts or relationships between entities or even events is way harder and requires a flexible rule-based pattern matcher. Given our long time background in Lisp and Prolog one can imagine we created a very powerful pattern matcher.

## SPARQL Access

Currently all the features above can be controlled as stored procedures or using Lisp as the command language. We have a new (beta) version that uses SPARQL for most of the control. Here are some examples. Note that fai is a magic-property namespace for "AI"-related stuff and inc is a custom namespace of an imaginary client:

1. Entity extraction

```
select ?ent {
    ?subj fai:entityTaxonomy inc:products .
    ?subj fai:entityTaxonomy inc:salesTerms .
    ?subj fai:textPredicate inc:text .
      ?subj  fai:entity(fai:language "en",  fai:taxonomy
```

```
inc:products) ?ent .
}
```

The expressions ?subj fai:entityTaxonomy inc:poducts and ?subj
fai:entityTaxonomy inc:salesTerms specify which taxonomies to
use (the appropriate matchers are cached).
The expression ?subj fai:entity ?ent will either return the
already extracted entities with the specified predicate
(fai:entity) or extract the new entities according to the
taxonomies in the texts accessible by fai:textPredicate.

2. fai:sentiment will return a single triple with sentiment
score:

```
select ?sentiment {
    ?subj fai:textPredicate inc:text .
    ?subj fai:sentiment ?sentiment .
    ?subj fai:language "en" .
    ?subj fai:sentimentTaxonomy franz:sentiwords .
}
```

3. Text classification:
Provided inc:customClassifier was already trained previously,
this query will return labels for all texts as a result of
classification.

```
select ?label {
?subj fai:textPredicate inc:text .
?subj fai:classifier inc:customClassifier .
?subj fai:classify ?label .
?label fai:storeResultPredicate inc:label .
}
```

**Further Development**
Our team is currently working on these new features:

- A more accessible UI (python client & web) to facilitate
  NLP and ML pipelines

- Addition of various classifier models
- Sequence classification support (already implemented for a customer project)
- Pre-trained models shipped with AllegroGraph (e.g. English NER)
- Graph ML algorithms (deepwalk, Google Expander)
- Clustering algorithms (k-means, OPTICS)

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# Answering the Question Why: Explainable AI

The statistical branch of Artificial Intelligence has enamored organizations across industries, spurred an immense amount of capital dedicated to its technologies, and entranced numerous media outlets for the past couple of years. All of this attention, however, will ultimately prove unwarranted unless organizations, data scientists, and various vendors can answer one simple question: can they provide Explainable AI?

Although the ability to explain the results of Machine Learning models—and produce consistent results from them—has never been easy, a number of emergent techniques have recently appeared to open the proverbial 'black box' rendering these models so difficult to explain.

One of the most useful involves modeling real-world events

with the adaptive schema of knowledge graphs and, via Machine Learning, gleaning whether they're related and how frequently they take place together.

When the knowledge graph environment becomes endowed with an additional temporal dimension that organizations can traverse forwards and backwards with dynamic visualizations, they can understand what actually triggered these events, how one affected others, and the critical aspect of causation necessary for Explainable AI.

Read the full article at AIthority.

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# Improving Data Processes with Knowledge Graphs

**AllegroGraph Thought Leadership Article from Big Data Quarterly**



Knowledge graphs link together data of any variety, structure, or format in business terms via uniform data models. Organizations can then join and traverse all of their data, semantically tagged with unique machine-readable identifiers, making the platform ideal for intelligent systems, machine learning analytics, interoperability, and an array of other benefits influential for AI applications.

The technology is gaining the attention of research firms and consultancies. In 2018 and 2019, knowledge graphs appeared on Gartner's Hype Cycle for Emerging Technologies, acknowledged

for their hearty connections to pertinent data. According to Gartner, "These ecosystems developed as digitalization morphed traditional value chains, enabling more seamless, dynamic connections to a variety of agents and entities across geographies and industries. In the future these will include decentralized autonomous organizations (DAOs), which operate independently of humans and rely on smart contracts."

Download the Full White Paper.

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# 100 Companies That Matter in Knowledge Management

Franz Inc., is proud to announce that it has been named to The 100 Companies That Matter in Knowledge Management by KMWorld. The annual list reflects the urgency felt among many organizations to provide a timely flow of targeted information. Among the more prominent initiatives is the use of AI and cognitive computing, as well as related capabilities such as machine learning, natural language processing, and text analytics.

"Knowledge management software and services providers are embracing a fresh wave of technological innovation to address heightened expectations—among both customers and employees—for the right information to be delivered to the right people at the right time, said Tom Hogan, Group Publisher at KMWorld. "To showcase organizations that are advancing their products and capabilities to meet changing requirements, KMWorld created the annual list of 100 Companies That Matter in Knowledge Management."

"We are honored to receive this acknowledgement for our

efforts in delivering Enterprise Knowledge Graph Solutions," said Dr. Jans Aasman, CEO, Franz Inc. "In the past year, we have seen demand for Enterprise Knowledge Graphs take off across industries along with recognition from top technology analyst firms that Knowledge Graphs provide the critical foundation for artificial intelligence applications and predictive analytics.   Our AllegroGraph Knowledge Graph Platform Solution offers a unique comprehensive approach for helping companies accelerate the creation of Enterprise Knowledge Graphs that deliver new value to their organization."

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# How To Avoid Another AI Winter

Forbes published the following article by Dr. Jans Aasman, Franz Inc.'s CEO.


Photo: GETTY

Although there has been great progress in artificial intelligence (AI) over the past few years, many of us remember the AI winter in the 1990s, which resulted from overinflated promises by developers and unnaturally high expectations from end users. Now, industry insiders, such as Facebook head of AI Jerome Pesenti, are predicting that AI will soon hit another wall—this time due to the lack of semantic understanding.

"Deep learning and current AI, if you are really honest, has a lot of limitations," said Pesenti. "We are very, very far from human intelligence, and there are some criticisms that are

valid: It can propagate human biases, it's not easy to explain, it doesn't have common sense, it's more on the level of pattern matching than robust semantic understanding."

Read the full article at Forbes.

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# California utilities should have used digital twin technology instead of power shutoffs

Northern California's proactive power outages were not necessary last fall. Digital Twin technology can predict utility line failures and turn off power in milliseconds to avoid the potential of sparks igniting the surrounding area.

Digital twin technologies are gaining traction across industries and use cases. Initially devised as a means of monitoring assets and production settings in manufacturing, this technology has quietly seeped into other verticals like hospitality, construction, and building management and soon, electricity delivery.

The premier problem digital twins will solve is predicting power grid failure, which would alleviate the social,

economic, and political issues that resulted from efforts to reduce the incidence and degree of catastrophes, property loss, and deaths stemming from downstream effects of power grid failure—such as recurring wildfires.

Digital twins can allay these concerns because they're based on real-time signals from a comprehensive set of factors that could be indicative of power grid woes related to environmental, meteorological, or technology concerns. Moreover, they can deliver accurate predictions for each of these factors well in advance of failure—in some cases as much as 28 days.

Read the full article at PowerGrid International.

# Franz Inc. to Present at The Global Graph Summit and Data Day Texas

Dr. Jans Aasman, CEO, Franz Inc., will be presenting, "Creating Explainable AI with Rules" at the Global Graph

Dr. Jans Aasman, CEO, Franz Inc.

Summit, a part of Data Day Texas. The abstract for Dr. Aasman's presentation:

*"There's a fascinating dichotomy in artificial intelligence between statistics and rules, machine learning and expert systems. Newcomers to artificial intelligence (AI) regard machine learning as innately superior to brittle rules-based systems, while the history of this field reveals both rules and probabilistic learning are integral components of AI. This fact is perhaps nowhere truer than in establishing explainable AI, which is central to the long-term business value of AI front-office use cases."*

*"The fundamental necessity for explainable AI spans regulatory compliance, fairness, transparency, ethics and lack of bias — although this is not a complete list. For example, the effectiveness of counteracting financial crimes and increasing revenues from advanced machine learning predictions in financial services could be greatly enhanced by deploying more accurate deep learning models. But all of this would be arduous to explain to regulators. Translating those results into explainable rules is the basis for more widespread AI deployments producing a more meaningful impact on society."*

The Global Graph Summit is an independently organized vendor-neutral conference, bringing leaders from every corner of the graph and linked-data community for sessions, workshops, and its well-known before and after parties. Originally launched in January 2011 as one of the first NoSQL / Big Data conferences, Data Day Texas each year highlights the latest

tools, techniques, and projects in the data space, bringing speakers and attendees from around the world to enjoy the hospitality that is uniquely Austin. Since its inception, Data Day Texas has continually been the largest independent data-centric event held within 1000 miles of Texas.

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# Franz's 2020 Predictions in the News

**Looking to the future of AI, KnowledgeGraph and Semantics we had a number of publications cover our views of where AllegroGraph is headed.**

**Datanami**

**20 AI Predictions for 2020**

*We're still in the midst of a fake news crisis, and with the emergence of deep fakes, it will likely get worse. Luckily, we have the technology available to begin to address it, says Dr. Jans Aasman, the CEO of Franz.*

"Knowledge graphs, in combination with deep learning, will be used to identify photos and video that have been altered by superimposing existing images and videos onto source images," Aasman says. "Machine learning knowledge graphs will also unveil the origin of digital information that has been published by a foreign source. Media outlets and social networks will use AI knowledge graphs as a tool to determine whether to publish information or remove it."

**DBTA**

**Ten Predictions for AI and Machine Learning in 2020**

*AI Knowledge Graphs will Debunk Fake News:"Knowledge Graphs in combination with deep learning will be used to identify photos and video that have been altered by superimposing existing images and videos onto source images. Machine learning knowledge graphs will also unveil the origin of digital information that has been published by a foreign source. Media outlets and social networks will use AI Knowledge Graphs as a tool to determine whether to publish information or remove it." – Dr. Jans Aasman, CEO of Franz, Inc.*

**SD Times**

**Software predictions for 2020 from around the industry**

*Jans Aasman, CEO of Franz, Inc.*
*Digital immortality will emerge: We will see digital immortality emerge in 2020 in the form of AI digital personas for public figures. The combination of Artificial Intelligence and Semantic Knowledge Graphs will be used to transform the works of scientists, technologists, politicians and scholars into an interactive response system that uses the person's actual voice to answer questions. AI digital personas will dynamically link information from various sources – such as books, research papers and media interviews – and turn the disparate information into a knowledge system that people can interact with digitally. These AI digital personas could also be used while the person is still alive to broaden the accessibility of their expertise.*

**Dataversity**

**Semantic Web and Semantic Technology Trends in 2020**

*"The big-name Silicon Valley companies (LinkedIN, Airbnd, Apple, Uber) are all building knowledge graphs. But more importantly, Fortune 500 companies, especially banks, are also investing in knowledge graph solutions."*

*IoT gets into the picture too. Aasman points to "digital twins," which can be thought of as specialized knowledge graphs, as an exceptionally lucrative element of the technology with an applicability easily lending itself to numerous businesses. Its real-time streaming data, simulation capabilities, and relationship awareness may well prove to be the 'killer app' that takes the IoT mainstream, he said. As an example, by consuming data transmitted by IoT sensors, digital twins will inform the monitoring, diagnostics, and prognostics of power grid assets to optimize asset performance and utilization in near real-time.*

## InsideBigData

## 2020 Trends in Data Modeling: Unparalleled Advancement

*Shapes Constraint Language (SHACL): SHACL is a framework that assists with data modeling by describing the various shapes of data in knowledge graph settings, which produces the desirable downstream effect of enabling organizations to automate "the validation of your data," remarked Franz CEO Jans Aasman. SHACL operates at a granular level involving classifications and specific data properties.*

## Workflow

## 2020 Trends in CyberSecurity

*Software-defined perimeter transmissions also guard information at the data layer by utilizing Datagram Transport Layer Security (DTLS) encryption and Public Key*

*Authentication. Fortifying information assets at the data layer is likely the most dependable method of protecting them, because it's the layer in which the data are actually stored. It's important to distinguish data layer security versus access layer security. The latter involves a process known as security filtering in which, based on particular roles or responsibilities, users can access data. "You can specify filters where for a particular user or a particular role whether you could see or not see particular [data]," Franz CEO Jans Aasman said. "You could say if someone has the role administrator, we're telling the system 'administrators cannot see [certain data]'."*

*Moreover, triple attributes can be based on compliance needs specific to regulations – which is immensely utilitarian in the post-GDPR data landscape. "For the government you could have a feature of whether you're a foreigner or not," Aasman said. "HIPAA doesn't care whether you're a foreigner or not, but you can do a separate mechanism for it."*

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# Graphorum — Dr. Aasman Presenting

## Graph-Driven Event Processing for Intelligent Customer Operations

Wednesday, October 16, 2019
10:15 AM — 11:15 AM
Level: Case Study

Dr. Jans Aasman, CEO, Franz Inc.

In the typical organization, the contents of the actual chat or voice conversation between agent and customer is a black hole. In the modern Intelligent Customer Operations center, the interactions between agent and customer are a source of rich information that helps agents to improve the quality of the interaction in real time, creates more sales, and provides far better analytics for management. The Intelligent Customer Operations center is enabled by a taxonomy of the products and services sold, speech recognition to turn conversations into text, a taxonomy-driven entity extractor to take the important concepts out of conversations, and machine learning to classify chats in various ways. All of this is stored in a real-time Knowledge Graph that also knows (and stores) everything about customers and agents and provides the raw data for machine learning to improve the agent/customer interaction.

In this presentation, we describe a real-world Intelligent Customer Organization that uses graph-based technology for taxonomy-driven entity extraction, speech recognition, machine learning, and predictive analytics to improve quality of conversations, increase sales, and improve business visibility.

https://graphorum2019.dataversity.net/sessionPop.cfm?confid=132&proposalid=11010