

# BORIS GALITSKY, PHD

*bgalitsky@hotmail.com*

Computer scientist with solid track record in all phases of application software development. Areas of expertise include: natural language processing, machine learning, search functionality, data mining, text analysis, and other techniques in artificial intelligence. Associate Professor of Computer Science, Agencia Nacional de Evaluacion de la Calidad y Acreditacion (“ANECA”), EU  
Apache Software Foundation contributor and speaker.

## EDUCATION

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| <b>PhD</b> | Institute for the Information Transmission Problems (Moscow, Russia),<br>Computer Science<br>Emphasis: Logical Programming in Natural Language and Scene Analysis | 1993 |
| <b>MS</b>  | Institute for the Information Transmission Problems (Moscow, Russia),<br>Computer Science<br>Emphasis: Technical Cybernetics                                      | 1991 |

## PROFESSIONAL EXPERIENCE

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| <b>Relyance AI</b> , San Jose, CA<br><i>Principal Data Scientist</i>                                                                                                                                                                                                                                                                                                                                                     | Jan. 2022 to current   |
| <ul style="list-style-type: none"><li>Responsible for the design and development of software for NLP processing and organization of legal documents, including semantic parsing, information extraction, automated annotation and de-identification features.</li></ul>                                                                                                                                                  |                        |
| <b>Oracle Corp.</b> , Redwood Shores, CA<br><i>Software Architect</i>                                                                                                                                                                                                                                                                                                                                                    | Nov. 2016 to Sep. 2021 |
| <ul style="list-style-type: none"><li>Oracle Digital Assistant Project: Responsible for the design and development of task-oriented chatbot for customer support, including ASR and NLP based relevance engine and dialog management features.</li><li>Researched and developed software tools for dialog management based on discourse linguistics and syntactic-analysis supported relevance determinations.</li></ul> |                        |
| <b>Ligadata, Inc.</b> , Menlo Park, CA<br><i>Director of Data Science</i>                                                                                                                                                                                                                                                                                                                                                | Sep. 2015 to Nov. 2016 |
| <ul style="list-style-type: none"><li>Responsible for the design and development of search and recognition software for financial documents, including ontology, thesaurus, and linguistic matching features.</li><li>Responsible for the design and development of big data analytics software, including extraction and aggregation, as well as content enrichment and recommendation features.</li></ul>              |                        |

**Elastica**, Mountain View, CA

Mar. 2014 to Sep. 2015

***Head of Semantic Analysis***

- Responsible for the design and development of Data Loss Prevention System software for ASR and NLP processing and classification of documents for enterprise system security and data loss prevention, including machine learning, document parsing, ontology building, web mining, content detection, features.

**Become.com**, San Jose CA

Dec. 2012 to Mar. 2014

***Chief Scientist***

- Responsible for the design and development of product search and recommendation software, including contextual advertisement placement, NLP parsing and analysis of webpages, content generation, machine learning, and user intent recognition features.

**eBay, Inc.**, San Jose CA

Aug. 2010 to Dec. 2012

***Lead Scientist / Sr. MTS***

- Responsible for the design and development of product search and recommendation software, including machine learning, linguistic profiling and web mining features.
- Responsible for the design and development of event demand forecasting and attendance recommendation engine for StubHub platform, including machine learning, data analysis, and event prediction features.

**AllVoices.com**, San Francisco

2009 to 2010

***Consulting Scientist***

- Consulting on projects involving NLP of documents. Content creation support for a political news website. Designed and developed content processing pipeline in Java. Proposed improved relevance algorithm based on matching syntactic parse tree. Designed web scraper for user generated content, video and images.

**Contextured.com**, London UK

2008 to 2010

***Consulting Scientist***

- Consulting on automated synthesis of advertisement media. Proposed a linguistic algorithm that takes text and extracts phrases with imperative verbs which can then form a three-line advertisement text similar to Google ad sense. Developed this algorithm in Stanford NLP and Apache OpenNLP. Conducted a number of advertisement and marketing studies assessing efficiency of the developed approach.

**IMShopping.com**, San Jose CA

2008 to 2010

***Consulting Scientist***

- Consulting on projects involving emulating shoppers' behavior. Designed a platform for shopping ideas management by buyers. Developed web scraping algorithm and a search engine for product search. Also designed and developed in Java a recommender based on collaborative filtering and also content-based recommendations employing product descriptions.

**Xoopit.com**, San Jose CA

2006 to 2007

**Consulting Scientist**

- Consulted on projects involving automated email processing. Designed and developed a pilot application that reads an email inbox, parses each email including subject, and groups by topic, sender intent and potential recipient reply intent. Developed information extraction framework in Java capable of extracting user intent based on sentence parsing. Developed email search and indexing approach for efficient email retrieval.

**Profilium.com**, Montreal Canada

2003 to 2006

**Consulting Scientist**

- Consulted on projects involving location tracking data mining. Developed an algorithm in Java for determining cell phone user position based on a number of intensity profile of signals from each tower. Proposed a machine learning approach to location prediction based on available tower signal dataset. Developed an indexing approach for efficient wireless location data storage.

**Uptake.com**, Palo Alto, CA

Oct. 2006 to Dec. 2008

**Founding Scientist**

- Responsible for the design and development of hotel industry search and recommendation software, including customer review parsing, feature de-duplication and aggregation, sentiment extraction and NLU features.

**iAskWeb, Inc.**, Boston MA

Aug. 1999 to Aug. 2005

**CTO and Co-Founder**

- Responsible for the design and development of multi-agent search engine software, including NLP and question answering features.

**SELECT PUBLICATIONS**

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**Books**

Galitsky B Goldberg S *Artificial Intelligence for Healthcare Applications and Management*, Elsevier (2022)

Galitsky, B., *Artificial Intelligence for Customer Relationship Management: Solving Customer Problems (Human-Computer Interaction Series)*, Springer (2021)

Galitsky, B., *Artificial Intelligence for Customer Relationship Management: Keeping Customers Informed (Human-Computer Interaction Series)*, Springer (2020)

Galitsky, B., *Developing Enterprise Chatbots: Learning Linguistic Structures*, Springer (2019)

Galitsky, B., *Computational Autism (Human-Computer Interaction Series)*, Springer (2016)

Galitsky, B., *Natural Language Question Answering System: Technique of Semantic Headers*, Advanced Knowledge International Pty. (2003)

### ***JRC Journal Publications***

- Galitsky, B., *A computational simulation tool for training autistic reasoning about mental attitudes*, Knowledge-Based Systems, Vol. 50:C (2013)
- Galitsky, B., *Machine learning of syntactic parse trees for search and classification of text*, Engineering Application of Artificial Intelligence, Vol. 26:3 (2013)
- Galitsky, B., *Exhaustive simulation of consecutive mental states of human agents*, Knowledge-Based Systems, Vol. 43 (2013)
- Galitsky, B., Dobrocsi, G., De La Rosa, J., *Inferring the semantic properties of sentences by mining syntactic parse trees*, Data & Knowledge Engineering (2012)
- Galitsky, B., De La Rosa, J., Kovalerchuk, B., *Assessing plausibility of explanation and meta-explanation in inter-human conflict*, Engineering Application of AI, Vol. 24:8 (2011)
- Galitsky, B., De La Rosa, J., *Concept-based learning of human behavior for customer relationship management*, Information Sciences, Vol. 181:10 (2011)
- Galitsky, B., De La Rosa, J., Kovalerchuk, B., *Discovering common outcomes of agents' communicative actions in various domains*, Knowledge-Based Systems, Vol. 24:2 (2011)
- Galitsky, B., González, M.P., Chesñevar, C.I., *A novel approach for classifying customer complaints through graphs similarities in argumentative dialogue*, Decision Support Systems, Vol. 46:3 (2009)
- Galitsky, B., Kuznetsov, S., *Learning communicative actions of conflicting human agents*, Journal of Experimental and Theoretical Artificial Intelligence, Vol. 20:4 (2008)
- Galitsky, B., *Merging deductive and inductive reasoning for processing textual descriptions of inter-human conflicts*, J. Intelligent Info Systems, Vol. 27:1 (2006)
- Galitsky, B., *Reasoning about mental attitudes of complaining customers*, Knowledge-Based Systems Elsevier, Vol. 19:7 (2006)
- Galitsky, B., *Disambiguation via default rules under answering complex questions*, Intl J. AI Tools, Vol. 14:1-2 (2003)

### ***JSR Conference Presentations***

- Galitsky, B., Usikov, D., Kuznetsov, S., *Parse Thicket Representations for Answering Multi-sentence questions*, International Conference on Conceptual Structures (2013)

Galitsky, B., Dobrocsi, G., De La Rosa, J., Kuznetsov, S., *Using Generalization of Syntactic Parse Trees for Taxonomy Capture on the Web*, International Conference on Conceptual Structures (2011)

Galitsky, B., Dobrocsi, G., De La Rosa, J., Kuznetsov, S., *From Generalization of Syntactic Parse Trees to Conceptual Graphs*, Conceptual Structures: From Information to Intelligence, International Conference on Conceptual Structures (2010)

Galitsky, B., González, M., Chesnevar, C., *Inductive Learning of Dispute Scenarios for Online Resolution of Customer Complaints*, Institute of Electrical and Electronics Engineers Conference on Intelligent Systems (2006)

Galitsky, B., Kuznetsov, S., *Scenario vs. Individual Claim Defeasibility: What Is More Important for Validity Assessment?*, International Conference on Conceptual Structures (2008)

Galitsky B., Kovalerchuk, B., Kuznetsov, S., *Learning Common Outcomes of Communicative Actions Represented by Labeled Graphs*, International Conference on Conceptual Structures (2007)

Galitsky, B., Kuznetsov, S., Samokhin, M., *Analyzing Conflicts with Concept-Based Learning*, Int. Conf. on Conceptual Structures (2005)

### ***Other Journal Publications & Conference Presentations***

Galitsky, B., Dobrocsi, G., De La Rosa, *Building Integrated Opinion Delivery Environment*, Florida Artificial Intelligence Research Society Conference (2011)

Galitsky, B., Dobrocsi, G., De La Rosa, *Mapping Syntactic to Semantic Generalizations of Linguistic Parse Trees*, Florida Artificial Intelligence Research Society Conference (2011)

Galitsky B., Kovalerchuk B., *Characterizing dialogue plausibility by explanation phase space*, International Association of Sciences and Technology for Development International Conference on Computational Intelligence (2009)

Galitsky B., Kuznetsov S., Neznanov A., *Inferring semantic properties of sentences by mining syntactic parse trees*, International Conference on Conceptual Structures (2009)

Galitsky, B., Usikov, D., *Programming Spatial Algorithms in Natural Language*. Association for the Advancement of Artificial Intelligence 2008 AAAI Workshop on Spatial and Temporal Reasoning (2008)

- Galitsky, B., Pascu A., *Epistemic categorization for analysis of customer complaints*, Florida Artificial Intelligence Research Society Conference (2006)
- Galitsky, B., *A Personalized Assistant for Customer Complaints Management Systems*, Advancement of Artificial Intelligence 2005 Spring Symposium on Persistent Assistants: Living and Working with AI (2005)
- Galitsky, B., *Implementing Commonsense Reasoning via Semantic Skeletons for Answering Complex Questions*, Florida Artificial Intelligence Research Society Conference (2005)
- Galitsky, B., *Use of Default Reasoning for Disambiguation Under Question Answering*, Florida Artificial Intelligence Research Society Conference (2004)
- Galitsky, B., *Use of virtual semantic headers to improve the coverage of natural language question answering domains*, Center for Discrete Mathematics & Theoretical Computer Science Tech Report 2002-10, Rutgers University (2002)
- Galitsky, B., *Designing the personalized agent for the virtual mental world*, Advancement of Artificial Intelligence Fall Symposium on Personalized Agents (2002)
- Galitsky B., Ourioupina O., *Application of default reasoning to semantic processing under question-answering*, Center for Discrete Mathematics & Theoretical Computer Science Tech Report 2001-16, Rutgers University (2001)
- Galitsky B., *Virtual Mental Space: Interaction with the characters of works of literature*, International Conference on Cognitive Technology (2001)
- Galitsky B., *Technique of semantic headers for answering questions in tax domain*, International Association of Science and Technology for Development Conference on Law & Technology (2000)
- Galitsky, B., *Natural Language Understanding with the Generality Feedback*, Center for Discrete Mathematics & Theoretical Computer Science Tech Report 99-32, Rutgers University (1999)
- Galitsky, B., *Narrative generation for the control of buyer's impression*, Advancement of Artificial Intelligence Spring Symposium on Intelligent Agents (1999)
- Galitsky, B., *Agents with adjustable autonomy for scheduling in the competitive environment*, Artificial Intelligence Spring Symposium on the Adjustable Autonomy (1999)
- Galitsky, B., *Understanding of definitions under NL interaction*, East-West Conference on Artificial Intelligence: From Theory to Practice (1993)

## **PATENTS & PUBLISHED PATENT APPLICATIONS**

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- US 2022/0138432: Relying on discourse analysis to answer complex questions by neural machine reading comprehension
- US 2022/0075954A1: Formulating Questions Using Differences Between Sets of Syntactic Trees and Differences Between Sets of Semantic Trees
- US 2022/0035998: Obtaining supported decision trees from text for medical health applications
- US 2022/0035845: Search indexing using discourse trees
- US 2021/0342548: Discourse parsing
- US 2021/0286830: Data loss prevention system for cloud security based on document discourse analysis
- US 2021/0279424: Conversational explainability
- US 2021/0240935: Management of a focused information sharing dialogue based on discourse trees
- US 2021/0232771: Acquiring new definitions of entities
- US 2021/0191988: Summarized logical forms for controlled question answering
- US 2021/0191938: Summarized logical forms based on abstract meaning representation and discourse trees
- US 2021/0174030: Chatbot providing a defeating reply
- US 2021/0165969: Detection of deception within text using communicative discourse trees
- US 2021/0150153: Using communicative discourse trees to detect a request for an explanation
- US 2021/0150152: Employing abstract meaning representation to lay the last mile towards reading comprehension
- US 2021/0150140: Detecting hypocrisy in text
- US 2021/0117613: Augmenting textual explanations with complete discourse trees
- US 2021/0103703: Generating recommendations by using communicative discourse trees of conversations

US 2021/0049329: Enabling rhetorical analysis via the use of communicative discourse trees

US 2021/0042473: Enabling chatbots by validating argumentation

US 2020/0410166: Enabling chatbots by detecting and supporting affective argumentation

US 2020/0380214: Enabling rhetorical analysis via the use of communicative discourse trees

US 2020/0372223: Enabling autonomous agents to discriminate between questions and requests

US 2020/0356605: Converting a document into a chatbot-accessible form via the use of communicative discourse trees

US 2020/0335109: Dialogue management using lattice walking

US 2020/0184155: Generating desired discourse structure from an arbitrary text

US 2020/0117709: Constructing conclusive answers for autonomous agents

US 2020/0073872: Content inversion for user searches and product recommendations systems and methods

US 2020/0004813: Social autonomous agent implementation using lattice queries and relevancy detection

US 2019/0236085: Building dialogue structure by using communicative discourse trees

US 2017/0221128: Sentiment Extraction From Consumer Reviews For Providing Product Recommendations

US 2009/0089252: Searching for associated events in log data

US 2009/0282019: Sentiment Extraction from Consumer Reviews for Providing Product Recommendations

US 2008/0172409: Customized Reporting and Mining of Event Data

US 2001/0053968: System, method, and computer program product for responding to natural language queries

US 11,449,682: Adjusting chatbot conversation to user personality and mood

US 11,386,274: Using communicative discourse trees to detect distributed incompetence

US 11,386,176: Inferring logical clauses for answering complex multi-hop open domain questions

US 11,373,632: Using communicative discourse trees to create a virtual persuasive dialogue

US 11,347,946: Utilizing discourse structure of noisy user-generated content for chatbot learning

US 11,328,016: Constructing imaginary discourse trees to improve answering convergent questions

US 11,321,536: Chatbot conducting a virtual social dialogue

US 11,295,085: Navigating electronic documents using domain discourse trees

US 11,182,412: Search indexing using discourse trees

US 11,100,144: Data loss prevention system for cloud security based on document discourse analysis

US 10,949,623: Using communicative discourse trees to detect a request for an explanation

US 10,853,574: Navigating electronic documents using domain discourse trees

US 10,853,581: Enabling rhetorical analysis via the use of communicative discourse trees

US 10,839,154: Enabling chatbots by detecting and supporting affective argumentation

US 10,839,161: Tree kernel learning for text classification into classes of intent

US 10,817,670: Enabling chatbots by validating argumentation

US 10,796,099: Enabling autonomous agents to discriminate between questions and requests

US 10,796,102: Enabling rhetorical analysis via the use of communicative discourse trees

US 10,679,011: Enabling chatbots by detecting and supporting argumentation

US 10,599,885: Utilizing discourse structure of noisy user-generated content for chatbot learning

US 10,592,505: Natural language interfaces for databases using autonomous agents and thesauri

US 10,402,411: Content inversion for user searches and product recommendations systems and methods

US 9,646,078: Sentiment extraction from consumer reviews for providing product recommendations

US 9,336,297: Content inversion for user searches and product recommendations systems and methods