João Sedoc

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Research Interests

Natural Language Understanding, Conversational Agents, Hierarchical Models, Deep Learning
Spectral Clustering, Spectral Estimation of Hidden Markov Models, Time Series Analysis

Academic Employment

Johns Hopkins University — Baltimore, MD
Assistant Research Professor, Computer Science Department — (2019 - present)

Education

2019	PhD	Computer Science	University of Pennsylvania, Philadelphia, PA
1999	BA	Mathematics	University of Pennsylvania, Philadelphia, PA
1999	BSE	Computer Science	University of Pennsylvania, Philadelphia, PA

Publications

Conference

1. **João Sedoc***, Sven Buechel*, Yoni Nachmany, Anneke Buffone, Lyle Ungar, "Generating Empathy and Distress Lexica from User Responses," LREC 2020.
2. Daphne Ippolito, Reno Kriz, Maria Kustikova, Maria Kustikova, **João Sedoc**, Chris Callison-Burch, "Comparison of Diverse Decoding Methods from Conditional Language Models," Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (ACL) 2019.
3. Tianyuan Zhou, **João Sedoc**, Jordan Rodu, "Getting in Shape: Word Embedding SubSpaces", International Joint Conference on Artificial Intelligence (IJCAI) 2019.
4. **João Sedoc***, Daphne Ippolito*, Arun Kirubarajan, Jai Thirani, Lyle Ungar, Chris Callison-Burch, "ChatEval: A Tool for Chatbot Evaluation", 2019 Demo System, Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL) 2019.
5. Tianlin Liu, Lyle Ungar, **João Sedoc**, "Continual Learning for Sentence Representations Using Conceptors", 2019 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL) 2019.

6. Reno Kriz, **João Sedoc**, Marianna Apidianaki, Carolina Zheng, Gaurav Kumar, Eleni Miltsakaki, Chris Callison-Burch, "Complexity-Weighted Loss and Diverse Reranking for Sentence Simplification", 2019 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL) 2019.
7. Tianlin Liu, Lyle Ungar, **João Sedoc**, "Unsupervised Post-processing of Word Vectors via Conceptor Negation", Thirty-Third AAAI Conference on Artificial Intelligence (AAAI) 2019.
8. Sven Buechel, Anneke Buffone, Barry Slaff, Lyle Ungar, **João Sedoc**, "Modeling Empathy and Distress in Reaction to News Stories", Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing (EMNLP) 2018.
9. **João Sedoc**, Daniel Preoţiuc-Pietro, Lyle Ungar, "Lexicon Expansion using Distributional Representations and Signed Clustering", Proceedings of the 15th Conference of the European Chapter of the Association for Computational Linguistics (EACL) 2017.
10. **João Sedoc**, Jean Gallier, Lyle Ungar, Dean Foster, "Semantic Word Clusters Using Signed Spectral Clustering", Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics (ACL) 2017.

Workshop

1. Gaurav Kumar, Bhavna Saluja, **João Sedoc**, Chris Callison-Burch, "Anonymization of Sensitive Information in Medical Health Records," MEDDOCAN Iberian Languages Evaluation Forum Workshop 2019.
2. Saket Karve, Lyle Ungar, **João Sedoc**, "Conceptor Debiasing of Word Representations Evaluated on WEAT," Workshop on Gender Bias for Natural Language Processing 2019.
3. **João Sedoc**, Lyle Ungar,"The Role of Target Word Lists in Bias Identification of Contextualized Word Representations," Workshop on Gender Bias for Natural Language Processing 2019.
4. **João Sedoc**, Daphne Ippolito, Arun Kirubarajan, Jai Thirani, Lyle Ungar, Chris Callison-Burch, "ChatEval: A Tool for the Systematic Evaluation of Chatbots", Workshop on Intelligent Interactive Systems and Language Generation (2IS&NLG) 2018.
5. Charles W. Kazer, **João Sedoc**, Kelvin K.W. Ng, Vincent Liu, Lyle Ungar, "Fast Network Simulation Through Approximation or: How Blind Men Should Describe Elephants", Workshop on Hot Topics in Networks (HotNets) 2018.
6. Tianlin Liu , **João Sedoc**, Lyle Ungar, "Correcting the Common Discourse Bias in Linear Representation of Sentences using Conceptors", BioCreative/OHNLP Challenge 2018.
7. **João Sedoc**, "Hierarchical Methods for a Unified Approach to Discourse, Domain, and Style in Neural Conversational Models", Thirty-Second AAAI Conference on Artificial Intelligence (AAAI) Doctoral Consortium 2018.
8. Sajal Choudhary, Prerna Srivastava, Lyle Ungar, **João Sedoc**, "Domain Aware Neural Dialog System", Workshop in Machine Translation, Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics 2017.
9. Grishma Jena, Mansi Vashisht, Abheek Basu, Lyle Ungar, **João Sedoc**, "Enterprise to Computer: Star Trek chatbot", WiNLP workshop of the Association for Computational Linguistics 2017.
10. **João Sedoc**, Jordan Rodu, Lyle Ungar, and Dean Foster, "Estimating Stock Covariance Using Factorial Hidden Markov Models", PGMO-COPI 2014.

In Progress

1. Sven Buechel, **João Sedoc**, H. Andrew Schwartz, Lyle Ungar, "Learning Neural Emotion Analysis from 100 Observations: The Surprising Effectiveness of Pre-Trained Word Representations".

2. **João Sedoc**, Lyle Ungar, "Item Response Theory for Efficient Human Evaluation of Chatbots".
3. **João Sedoc**, Sharath Chandra Guntuku, Lyle Ungar, "Youngbot: Age Mimicking Dialogue Agent".
4. Qizhen Zhang, Charles W. Kazer, Vincent Liu, Lyle Ungar, **João Sedoc**, "Large-scale Computer Network Modeling: A New Problem for Deep Learning".
5. Charles W. Kazer, Qizhen Zhang, **João Sedoc**, Kelvin K.W. Ng, Vincent Liu, Lyle Ungar, "Mimics: Fast Data Center Network Simulation Through Approximation".
6. **João Sedoc**, Jordan Rodu, Dean Foster, Lyle Ungar, "Neural Tree Transducers for Tree to Tree Learning".
7. **João Sedoc**, Jordan Rodu, Lyle Ungar, Dean Foster, "Multiscale Hidden Markov Models For Covariance Prediction".
8. Jordan Rodu, **João Sedoc**, Dean Foster, Lyle Ungar, "Extending Spectral Estimation of HMMs to Continuous Distributed Output".
9. **João Sedoc**, Derry Wijaya, Masoud Rouhizadeh, Andy Schwartz, Lyle Ungar, "Deriving Verb Predicates By Clustering Verbs with Arguments".
10. **João Sedoc**, Aline Normoyle, "Seating Assignment Using Constrained Signed Spectral Clustering".

Teaching

University of Pennsylvania CTL Teaching Certificate	
Instructor	Spring 2020
Deep Learning Methods for Automated Discourse	Johns Hopkins University
Co-Instructor	Fall 2019
Artificial Intelligence	Johns Hopkins University
Instructor (unofficial)	Spring 2017
Special Topics - Deep Learning Methods for Automated Discourse	University of Pennsylvania
Teaching Assistant	Fall 2014
Graduate Linear Algebra taught by Jean Gallier	University of Pennsylvania
Teaching Assistant	Summer 2014
Graduate Theory of Computation taught by Jean Gallier	University of Pennsylvania

Invited Talks

Bloomberg, Multiscale Methods for Covariance Estimation and Assumptions made in Academic Timeseries Forecasting, February 2020.
Capital One, Evaluating Conversational Agents, November 2019.
New York Academy of Sciences, Evaluating Conversational Agents, November 2019.
Boston College, Practitioner's Perspective on Quantitative Investing, November 2019.
Spotify, Building and Evaluating Conversational Agents, August 2019.
2nd International Conversational Intelligence Summer School, Evaluating Conversational Agents, June 2019.
NYU Medical School, Building and Evaluating Conversational Agents, May 2019.
Temple University, Building and Evaluating Conversational Agents, April 2019.
Swarthmore College, Chivalric High Frequency Trading Platform Design, April 2019.

University of Pennsylvania e-talks, Modeling Empathy and Distress in Reaction to News Stories, March 2019.
International Convention of Psychological Science, Modeling Empathy and Distress in Reaction to News Stories, March 2019.
Johns Hopkins University, Building and Evaluating Conversational Agents, February 2019.
Columbia University, Building and Evaluating Conversational Agents, February 2019.
NYU Stern, Building and Evaluating Conversational Agents, February 2019.
Didi Labs, Building and Evaluating Conversational Agents, January 2019.
Boston University, Building and Evaluating Conversational Agents, December 2018.
Grammarly, Building and Evaluating Conversational Agents, November 2018.
University of Delaware, Building and Evaluating Conversational Agents, October 2018.
Temple University, Building and Evaluating Conversational Agents, October 2018.
Boston College, Practitioner's Perspective on Quantitative Investing, November 2016.
Boston College, Practitioner's Perspective on Quantitative Investing, November 2015.

Professional Experience

Amazon Core Machine Translation — Pittsburgh
Applied Scientist Intern, (Summer 2017)

 Created novel deep learning methods for machine translation

Chivalric Trading LLC / Chambertin LLC — Chicago
Managing Member and Founder, (2010 - present)

 Formed an exclusive partnership with Ronin Capital, LLC
 Facilitated Chivalric Trading IP use for Ronin Capital's high and medium frequency trading software and research platform
 Employed novel statistical high and medium frequency models
 Directed and implemented Digital Signal Processing strategies
 Consulted to design low latency resilient encryption over Radio Frequency

Millenium Partners — New York
Portfolio Manager, (2007 - 2009)

 Architect and designer of Chivalric trading platform
 Researched, implemented and traded automated high frequency models
 Focused research on optimization and microstructure models
 Recruited a high frequency trading strategy team

Cooper Neff / BNP Paribas — King of Prussia/ Paris / New York
Global Head of High Frequency Research, Director (2004 - 2007)

 Built high and medium frequency models for global markets
 Managed the research group
 Lead redesign of alpha and risk models
 Incubated new trading algorithms globally

Researcher, Vice President (2001 - 2004)

    Created new optimization methodology for basket rotation trading
    Created high frequency microstructure and medium frequency
    Created pan-European models post euro integration
    Managed all Asian model development

Research Programmer, Analyst (1999 - 2001)

    Worked on proprietary risk models (Fama and French)
    Descriptive analysis of the Australian order by order market data

Awards

Fontaine Travel Award (2017,2019)
AAAI Doctoral Consortium Travel Award (2018)
Fontaine Fellowship (2016-2017)
J.P. Eckert Fellowship (2013)
NSF Young Scholars Program (1993)

Grants

Current Grants

Amazon AWS Cloud Computing Research Credits [$25,000] (2019)

Pending Grants

IDIES Seed Funding: Developing Automated Conversational Agents to Support Health Workers in
    Countering Vaccine Hesitancy
IDIES Seed Funding: Developing an Artificially Intelligent Sexual and Reproductive Health
    Counseling Conversational Agent in Uganda

Past Grants

Microsoft Research Dissertation Grant [$25,000] (2018-2019)

Community Service

Board member Herman Sno Stichting (2017-Present)
Organizing committee Workshop on Chatbots and Conversational Agents and Dialogue Breakdown
    Detection Challenge (WOCHAT+DBDC) 2020
Organizing member Workshop on Chatbots and Conversational Agents and Dialogue Breakdown
    Detection Challenge (WOCHAT+DBDC) 2019
PC member Mid-Atlantic Student Colloquium on Speech, Language and Learning (2017)

Organizer of the Mid-Atlantic Student Colloquium on Speech, Language and Learning (2016)
Organized Computational Linguistics Lunch (2014-2016)
Ran the PennStat Natural Language Reading Group (2014-Present)
Student Mentor Lea Middle School (2015)
Graduate student advisor for Penn Emerging Scholars Program (2014-2018)
Reviewing: AAAI (2015,2018)
Reviewing: ACL (2018,2019)