

Daniel Campos

707 S Birch Street, Urbana, IL (415)-272-9964 — dcampos3@illinois.edu — <https://spacemanidol.github.io/>

EDUCATION

University of Illinois Urbana-Champaign(UIUC)-*PhD Computer Science* 06/2020- 3.57
University of Washington-*MS Computational Linguistics* 06/2018-12/2020 3.68
Rensselaer Polytechnic Institute-*BS Computer Science* 08/2011-05/2015 3.43

Publications

2021

- Leveraging Sparsity For Efficient Natural Language Understanding Inference - **Daniel Campos**, Tuan Li, Mark Kurtz, Dan Alistarh, Benjamin Fineran - Under Review at Efficient Natural Language and Speech Processing @ NEURIPS 2021
- IMG2SMI: Translating Molecular Structure Images to Simplified Molecular-input Line-entry System - **Daniel Campos**, Heng Ji - Arxiv Preprint
- Curriculum learning for language modeling - **Daniel Campos** - Arxiv Preprint
- TREC Deep Learning Track: Reusable Test Collections in the Large Data Regime - Nick Craswell, Bhaskar Mitra, Emine Yilmaz, **Daniel Campos**, Ellen Voorhees and Ian Soboroff - SIGIR 2021
- MS MARCO: Benchmarking Ranking Models in the Large-Data Regime - Nick Craswell, Bhaskar Mitra, Emine Yilmaz, **Daniel Campos**, Jimmy Lin - SIGIR 2021
- Significant Improvements over the State of the Art? A Case Study of the MS MARCO Document Ranking Leaderboard - Jimmy Lin, **Daniel Campos**, Nick Craswell, Bhaskar Mitra, Emine Yilmaz - SIGIR 2021
- Overview of the TREC 2020 deep learning track - Nick Craswell, Bhaskar Mitra, Emine Yilmaz, **Daniel Campos** - TREC 2020

2020

- Explorations In Curriculum Learning Methods For Training Language Models - University of Washington Computational Linguistics Master's Thesis
- GAIA at SM-KBP 2020 - A Dockerized Multi-media Multi-lingual Knowledge Extraction, Clustering, Temporal Tracking and Hypothesis Generation System - Manling Li, Ying Lin, Tuan Manh Lai, Xiaoman Pan, Haoyang Wen, Sha Li, Zhenhailong Wang, Pengfei Yu, Lifu Huang, Di Lu, Qingyun Wang, Hao-ran Zhang, Qi Zeng, Chi Han, Zixuan Zhang, Yujia Qin, Xiaodan Hu, Nikolaus Parulian, **Daniel Campos**, Heng Ji, Brian Chen, Xudong Lin, Alireza Zareian, Amith Ananthram, Emily Allaway, Shih-Fu Chang, Kathleen McKeown, Yixiang Yao, Michael Spector, Mitchell DeHaven, Daniel Napierski, Marjorie Freedman, Pedro Szekely, Haidong Zhu, Ram Nevatia, Yang Bai, Yifan Wang, Ali Sadeghian, Haodi Ma, Daisy Zhe Wang - Proceedings of Thirteenth Text Analysis Conference 2020
- ORCAS: 18 Million Clicked Query-Document Pairs for Analyzing Search - Nick Craswell, **Daniel Campos**, Bhaskar Mitra, Emine Yilmaz, Bodo Billerbeck-CIKM 2020
- XGLUE: A New Benchmark Dataset for Cross-lingual Pre-training, Understanding and Generation - Yaobo Liang, Nan Duan, Yeyun Gong, Ning Wu, Fenfei Guo, Weizhen Qi, Ming Gong, Linjun Shou, Daxin Jiang, Guihong Cao, Xiaodong Fan, Ruofei Zhang, Rahul Agrawal, Edward Cui, Sining Wei, Taroon Bharti, Ying

Qiao, Jiun-Hung Chen, Winnie Wu, Shuguang Liu, Fan Yang, **Daniel Campos**, Rangan Majumder, Ming Zhou - EMNLP 2020

- On the Reliability of Test Collections to Evaluating Systems of Different Types - Emine Yilmaz, Nick Craswell, Bhaskar Mitra and **Daniel Campos** - SIGIR
- Overview of the TREC 2019 deep learning track Nick Craswell, Bhaskar Mitra, Emine Yilmaz, **Daniel Campos**, Ellen M. Voorhees, - TREC 2019
- Leading Conversational Search by Suggesting Useful Questions Corbin Rosset, Chenyan Xiong, Xia Song, **Daniel Campos**, Nick Craswell, Saurabh Tiwary and Paul Bennett - WWW 2020

2019

- Open Domain Web Keyphrase Extraction Beyond Language Modeling - Lee Xiong, Chuan Hu, Chenyan Xiong, **Daniel Campos**, Arnold Overwijk and Xiyu Huang - EMNLP 2019
- Overview of the TREC 2019 deep learning track Nick Craswell, Bhaskar Mitra, Emine Yilmaz, **Daniel Campos**, Ellen M. Voorhees, - TREC 2019

2018

- MS MARCO: A Human Generated MACHine Reading COMprehension Dataset Payal Bajaj, **Daniel Campos**, Nick Craswell, Li Deng, Jianfeng Gao, Xiaodong Liu, Rangan Majumder, Andrew McNamara, Bhaskar Mitra, Tri Nguyen, Mir Rosenberg, Xia Song, Alina Stoica, Saurabh Tiwary, Tong Wang

EXPERIENCE

AI Researcher - Neural Magic 10/2020-Present

- Researched methods of compression for NLP systems inference around Question Answering, Summarization, and Information Retrieval using PyTorch, Hugging-Face, and SparseML.
- Compressed models using knowledge distillation, unstructured pruning and structured pruning which when combined with deep sparse inference engine resulted in over 20x inference throughput.

Research Assistant- UIUC 06/2020-2/2021

- Created multi modal models for molecule property prediction from chemistry papers using PyTorch, torch vision, and hugging-face's transformers as part of Molecule Maker Lab Institute under Prof. Heng Ji.
- Develop AI models which were used to detect and track geopolitical influence campaigns as part of DARPA's INCAS(Influence Campaign Awareness & Sense-making) project.

Senior Product Manager-Microsoft Research & AI, Bing 11/2017-10/2020

- Architected relevance metrics stack into a real time streaming system through new human labeling tasks, novel data sampling methods, and metrics aggregation. Labeling scaled to \$7m/year across 16 markets generating more than 1,000,000 judgments a week. The pipeline went from measuring user experience years old to seconds old. To scale the pipeline created a novel multi class-stratified sampling method using the Horvitz-Thompson estimator, work under review.
- Built family of MSMARCO Datasets and baselines including QnA, Passage Ranking, and Keyphrase Extraction, which collectively have been used by over 10000 Researchers. Papers Cited over 800 times and competitive datasets with over 500 research submissions. Dataset creation using Pandas and baselines models built in PyTorch and Tensorflow.

- Research and analyzed search relevance and user experience for the executive team across various verticals, languages, and metrics using language embeddings, sampling methodologies, and classification methods. Analysis and visualization done through tSNE, Pandas, Numpy, ANNOY, and Plotly

Product Manager 2-Microsoft Cloud + AI, Global Services 05/2016-11/2017

- Designed, built, and deployed Neural Machine Translation(NMT) into a software localization pipeline all Cloud and Enterprise Microsoft products. Using the NMT models, supplier contracts were renegotiated, saving 20% \$3m/year over the next three years.
- Optimized and scaled the NLP system for customer feedback translation, filtering, and categorization, decreasing team effort by 80% using NLTK, Tensorflow, and sci-kit-learn.
- Drove end to end localization and internationalization for Azure and Visual Studio products, including automation, bug triage, budgeting, vendor, and release management for \$4m/year worth of translations.

Product Manager-Microsoft, Azure RemoteApp Summer 2014 & 08/2015-05/2015

- Designed scalable multi-cloud network architecture for cloud-based Remote Desktop Service and drove large scale deployment to alpha customers and Microsoft.
- Created and scaled a predictive user demand modeling pipeline which, optimized VM usage by 20%.

NLP Researcher-Basis Technology 01/2014-05/2014

- Grew the Rosette Entity Resolution pipeline to decrease document analysis time, increase accuracy, and increase throughput while expanding language support to Spanish, Russian, French, Farsi, and Chinese.
- Re-designed the systems machine-learned architecture to state of the art neural methods, which improved multilingual accuracy to English parity.
- Formalized data creation, data ingestion, retrieval, formatting, and analysis pipeline using Bash, Java, and Python primarily. Optimized models were ANN, KNN, SVMs, LSTMs, and Decision Trees.

Software Engineer-Cisco Systems Summer 2013

- Developed JavaScript tooling for collecting user feedback, bug tracking, and HTML5 based screenshot used with alpha customers during initial product launches.
- Led a team of 12 other interns to develop a novel food ordering system for cafeterias that used containerized Node.js and MongoDB applications allowing efficient scaling.

Co-Founder/Software Engineer- Gapelia 08/2013-05/2014

- Built an end to end digital multi modal publishing platform which allowed non-technical users to create and publish beautiful digital magazines in a matter of minutes.
- Created REST API in Java, front end in Express, and deployed in AWS with Apache Tomcat, Maven, and MongoDB.
- Won the RPI 2014 Business Model Competition 1st place, 2014 Why not change the world grant, Harvard iLab cultural entrepreneurship challenge, and was member of Harvard's Innovation Lab 01/2014-05/2014.

Software Engineer-GE Capital Summer 2012

- Developed a reusable web system in Bootstrap, Javascript and PHP which allowed GE employees to create websites that matched corporate guidelines around colors, fonts, icons, etc.

Awards and Research Activities

Fellowships

- Gene Golub FELLOWSHIP at UIUC - 2020-2021
- Summer Predoctoral Institute Fellow at UIUC - 2020

Patents

- Using a Multi-Task-Trained Neural Network to Guide Interaction with a Query-Processing System via Useful Suggestions- 408364-US-NP - Filed 4/16/2020
- Keyphrase Extraction Beyond Language Modeling - U.S. Appln. No. 16/460,853 - Filed July 2nd, 2019

Academic Activity

- Efficient Language Model Training and Inference - Invited Talk at Qualtrics Research
- NIST TREC 2021 Deep Learning-Track Coordinator
- NIST TREC 2020 Deep Learning-Track Coordinator
- NIST TREC 2019 Deep Learning-Track Coordinator
- ACM SIGIR/SIGKDD Africa Summer School on Machine Learning for Data Mining and Search 2019-Invited Lecturer for Deep Learning in Search
- AACM SIGIR/SIGKDD Africa Summer School on Machine Learning for Data Mining and Search 2020-Invited Lecturer for Deep Learning in Search