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Alon Albalak

About Me

I am a Ph.D student in the Computer Science Department at the University of California, Santa Barbara, co-advised by William Yang Wang and Xifeng Yan. My work lies at the intersection of natural language processing, machine learning, and logic. I mainly focus on data efficiency in NLP through transfer learning, data augmentation and neuro-symbolic methods.

Education

2018–present **Ph.D, Computer Science**, *University of California, Santa Barbara*.
UCSB NLP Group
Advisors: William Yang Wang and Xifeng Yan

2016–2018 **B.S., Mathematics**, *Wayne State University*.

Publications and Patents

2022 **FETA: A Benchmark for Few-Sample Task Transfer in Open-Domain Dialogue**.
Alon Albalak, Yi-Lin Tuan, Pegah Jandaghi, Connor Pryor, Luke Yoffe, Deepak Ramachandran, Lise Getoor, Jay Pujara, William Yang Wang.
Preprint [code]

2022 **Addressing Issues of Cross-Linguality in Open-Retrieval Question Answering Systems For Emergent Domains**.
Alon Albalak, Sharon Levy, William Yang Wang.
Preprint [code]

2022 **D-REX: Dialogue Relation Extraction with Explanations**.
Alon Albalak, Varun Embar, Yi-Lin Tuan, Lise Getoor, William Yang Wang.
To appear in NLP for Conversational AI Workshop, ACL 2022. Preprint [code]

2021 **Systems and methods for determining and using semantic relatedness to classify segments of text**.
Rohit Jain, Devin H. Redmond, Richard B. Sutton, Alon Albalak, Sharon Huffner.
US Patent US20210279420A1

2021 **Emotion Recognition in Conversation using Probabilistic Soft Logic**.
Eriq Augustine, Alon Albalak, Anurag Prakash, Connor Pryor, William Yang Wang, Lise Getoor.
Preprint

2021 **Modeling Disclosive Transparency in NLP Application Descriptions**.
Michael Saxon, Sharon Levy, Alon Albalak, Xinyi Wang, William Yang Wang
To appear in **EMNLP 2021 Main Conference**. Preprint

2019 **The Sounds of Seizures: Audio-Triggered Detection by Convolutional Neural Network**.
Maysaa Basha, Alon Albalak, Hani Alhourani, Aashit Shah, Ming Dong
Published in Neurology

2017 **Decoding User's Intention from Surface EEG Signals Using Machine Learning Algorithms**.
Alon Albalak, Guanghua Xu, Chaoyang Chen, Ming Li, John M Cavanaugh
Annual Meeting of BMES (Poster)

Selected Projects

February 2021 – present **Recommender Dialogue Systems**, *in collaboration with UCSC, USC, Google.*

- Actively collaborating with researchers across institutions to solve problems in dialogue systems such as explainability, information extraction, and zero- or few-shot dialogue classification tasks
- Led a team in the design, development, and publication of state-of-the-art work on the explainability of relation extraction methods in dialogue
- Applied Probabilistic Soft Logic (PSL) to the task of emotion recognition in conversation to achieve state-of-the-art results

Advisors : Industry - William W. Cohen and Tania Bedrax-Weiss
Academic - William Yang Wang (UCSB), Lise Getoor (UCSC), and Jay Pujara (USC)

June 2021 – present **Alexa Prize Taskbot Challenge**, *Team Lead.*

- 8% acceptance rate
- Led and advised UCSB's "Team GauchoBot" in developing an agent that assists real Alexa customers to complete cooking and do-it-yourself projects that require multiple steps and complex decision making
- Designed algorithms for intent classification and question answering as well as the communication architecture between modules
- Extensively used AWS services including, but not limited to, EC2, ECS, ECR, S3, CloudWatch, DynamoDB, and Lambda

May 2021 – October 2021 **COVID(ATACK)**, *in collaboration with IARPA and Peraton Labs.*

- Mentored a visiting undergraduate researcher
- Built a multilingual open-retrieval question answering system for COVID-related journal articles and a clinical trials database
- Designed and implemented:
  - a multilingual deep semantic indexing method to retrieve relevant documents
  - a multilingual reading comprehension system to find answers within a document
- Online demo will be available shortly

Professional Experience

June 2019 – September 2020 **Research Associate**, *Theta Lake.*

- Built classifiers for automated risk detection in regulated industries through the use of natural language processing and other machine learning techniques
- Took multiple projects from inception to production, and developed 2 patent pending methods along the way

December 2017 – September 2018 **Machine Learning Research Associate**, *Machine Vision and Pattern Recognition Lab*, Wayne State University.

- Research funded by the Epilepsy Foundation, titled "The Sound of Seizures"
- Built computer vision based CNN-LSTM model predicting the onset of seizures with 91% accuracy
- Optimized neural network in Keras/TensorFlow for portability to mobile devices

July 2016 – July 2017 **Research Assistant**, *Robotic Rehabilitation and Neurophysiology Lab*, Wayne State University.

- Custom built an arduino controlled lower limb exoskeleton
- Implemented neural network on motor cortex EEG data to control exoskeleton using python and matlab
- Built system to control a motorized wheelchair through EEG and EMG with a deep neural network

Fellowships & Awards

2018 **Integrative Graduate Education and Research Traineeship (IGERT) Fellow**, *University of California, Santa Barbara.*

2018 **Academic Excellence Fellowship**, *University of California, Santa Barbara.*

2018 **Chia Kuei Tsao Award**, *Wayne State University.*
For outstanding academic achievement in the undergraduate mathematics program

Technical skills

Tools	Python, C++, Shell, AWS, Azure
Packages	PyTorch, TensorFlow, Keras, NumPy, SciPy
Machine Learning	Natural language processing (NLP), computer vision (CV), transformers, sequence to sequence models, statistical analysis, regression, clustering

Teaching Experience

Spring, 2020 **CS 165a: Artificial Intelligence - Lead TA**.

Fall 2020 – Spring 2021 **CS 9: Object Oriented Programming**.

Military Experience

2012 – 2015 **Reconnaissance Sabotage Unit**, *Israel Defense Forces*.

- Engineering, demolitions, and reconnaissance specialty training
- Battalion lead navigator