Lerner Zhang

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Objective

Seeking a full-time position that will leverage my outstanding skills for engineering and 5.5 years of experience in natural language processing, information retrieval and machine learning.

Education

Hunan University of Science and Technology, Xiangtan, Hunan

Bachelor's degree | 2009 - 2013

Education Technology

GPA: 3.5, our courses cover basic skills in information technology, psychology and media technology. Education technology leverages information technology to empower learning.

East China Normal University, Putuo, Shanghai

Academic Master's degree | 2013 - 2016

Education Technology

GPA: top 5%. Our courses include educational statistics and programming and etc. The title of my thesis is An Open Source Approach to EFL Writing Technology where we proposed an open source writing teaching approach based on process writing, version control and natural language processing.

Experience

May 2019 – Present

Senior algorithm engineer | Alibaba Group - Banma | Shanghai

- Intent detection and slot filling

  Do exploratory data analysis and find that context free grammar cannot deal with external entities. Size the opportunity to improve the system using BERT and CRF. Augment datasets using BNF rules and language modeling. Weight instances by its frequency and timestamp. Use knowledge one hot to provide more prior information for the model. Use KBERT for robust knowledge prior encoding.

- Entity linking

  Analyze the entity problems in the user data using R. Measure the actual performance of the system and set reasonable goals. Utilize important features such as entity description, popularity, individual data, distance and pinyin to experiment using Triplet loss and Arcface loss. Reference to PyTorch open source code and translate it into

TensorFlow. Approximately retrieve the nearest neighbors of a mention using FAISS for the first ranking and do the second using user's historical data.

- Addressee detection

  Manually label user data and analyze false positives (1% pure entities and 3% command like queries) and false negatives (7% inexactly matched music entities) errors. Propose the addressee detection task and convert the metric set by product managers to machine learning metrics. Retrieve contextual data using SQL. Map user's historical utterances and behaviors to if the voice car assistant is addressed or not. Reduce the false positive rate from 5% to 1.4% and increase the recall from 84% to 93%. Deploy the model to the RTP using C++. Run bootstrap-based a/b tests to ensure best user experiences.

- MLOps

  Continual/incremental/lifelong learning with ci/cd pipeline. Monitor the system's performance and detect data drift. Train offline Bayesian teachers and distill the uncertainty of labeled and unlabeled data to a student model. Design data labeling and evaluate labeling reliability using intra or inter-rater agreement statistics. Automatically detect and correct noise in data using MC dropout and Shapley values. Replace the currently using model by the best student model when necessary.

Oct 2018 – Jan 2019

AI algorithm engineer | ifchange | Shanghai

- Person-job fit

  Mining large volumes of resume data using Hadoop and Spark. Rank resumes according to jab descriptions using deep networks. Do data analysis to find patterns of talent flows between cities.

- Verb direct-object selectional preferences

  Tried CRF, KL divergence, word2vec, pointwise mutual information and K-means to find a verb's direct object selectional preferences.

Nov 2015 – Sep 2018

NLP researcher | deepbrain.ai | Shanghai

- Text summarization

  Experiments on Seq2Seq LSTM model, point generator, self-critical model and GAN, hybrid convolution to convolution, embedding sharing hybrid decoding network to generate summarization of long texts. Developed a simple library for extractive summarization.

- Named entity recognition and data ingestion and mining

  Train CRFs to extract music entities from user data. Craw and clean data using Python Requests, Scrapy and Selenium, and Regex.

Other Related Skills

Python, SQL, R, Vim, Linux, C++, Java, Docker, MongoDB and etc.

Awards & Acknowledgments

IELTS(2016): 6.5, CET-6(2011): 521, NCRE 3 (database, 2010), NCRE 2 (C language programming, 2010)

National encouragement award (2012)

In spare time I taught myself statistics, algorithm, and machine learning and wrote some articles like this tutorial and some answers on StackExchange Stats and more answers on Quora. Gained 15K reputation on StackExchange.

Courses

XCS224N - Natural Language Processing with Deep Learning

CS228 - Probabilistic Graphical Models: Principles and Techniques

CS230 - Deep Learning

Algorithmic Toolbox

Data Structures

Algorithms on Graphs

Introduction to Probability and Data with R

Linear Regression and Modeling

Inferential Statistics