

Jacob Fuehne

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EDUCATION

University of Illinois at Urbana-Champaign

Bachelor of Science in Computer Science and Linguistics

May 2021

GPA: 3.8/4.0

- 1st place in 2019 Mechmania AI hackathon
- Coursework: Algorithms, Artificial Intelligence, Applied Machine Learning, Audio Computing Lab, Computational Linguistics, Computer Architecture, Computer Systems, Corpus Linguistics, Data Structures, Statistics, Programming Languages and Compilers

RESEARCH

Jacob Fuehne "A Review of the Unified Corpus and a Methodology for Improvement on Generalizable Emotion Detection" Preprint December 2020 [\[PDF\]](#)

Jacob Fuehne, Vivek Nair "Systems Enabling the Use of Natural Language Processing Methods for Software-Based Leak Detection, Prevention, and Mitigation" White Paper February 2020 [\[PDF\]](#)

SKILLS

Languages: Python, Java, JavaScript, C++, C#, SQL, R, HTML, CSS, C

Software/Frameworks: NumPy, Pandas, NLTK, Matplotlib, OpenCV, ReactJS, Flask, Selenium, JUnit, PyTorch, REST API, Bash, Git, ngrok

Skills/Concepts: BERT, Convolutional Neural Network (CNN), Finite State Machines, Git, GPT, JUnit, Linux, POS tagging, Parsing, Recurrent Neural Network (RNN), Regex, Robotic Process Automation (RPA), Sentiment Analysis, Seq2Seq, Text Analytics, Tokenization, Topic Modelling, Transformers

EXPERIENCE

Albemarle Corporation

Artificial Intelligence Engineer

Charlotte, NC

April 2023 – Present

- Provided NLP expertise to Albemarle in decision making and developing an enterprise chatbot using Microsoft Bot Framework SDK and Azure
- Integrated chatbot with REST APIs to query SAP S/4 HANA, Ariba, Concur, Workday, Salesforce, Azure, and ServiceNow for user requests.
- Designed chatbot architecture and project delivery model in accordance with leadership's goals and resource availability, as well as identifying areas of improvement.
- Designed NLP and ML features for custom in-house data analytics for IT ticketing and chatbot usage using BERTopic, LDA, and TopicGPT.

Cognizant

SQA Automation Engineer (contractor for Gilead Sciences)

Raleigh, NC

June 2021 – March 2023

- Transitioned **Gilead Sciences** to automated test scripts for their Identity Management app and maintained test user databases using SQL.
- Collaborated with software engineering team as SQA lead to resolve defects and manage SQA resources to meet project timelines.
- Responsible for independently writing test plans, reports, cost savings metrics, and ensuring test requirement coverage during execution.

Solid Security

NLP research Intern

Champaign, IL

October 2019 – April 2020

- Developed a program in Java to generate and index idiomatic permutations of a document through a custom Spintax ruleset, then identify the source of a leaker via semantic distance algorithms, syntactic differences, statistical analysis, and repeated exposure
- Researched and tested effectiveness between various algorithms in literature survey such as Hamming Distance, Levenshtein Detailed Distance, word2vec skip-gram, character n-grams, and more
- Wrote preprint papers and reviewed current literature on paraphrase detection and generation for text (code is public on my GitHub)

AbbVie Inc.

Software Engineer Intern

Champaign, IL

April 2019 – August 2019

- Worked with an Agile team of interns and a mentor to automate document processing for clinical drug trials, allowing pharmaceutical researchers to reallocate more than \$200,000 in salary hours towards doing research rather than reviewing documents
- Implemented image recognition, machine learning, and statistical techniques in Python utilizing OpenCV, Matplotlib, NumPy, and other libraries to recognize and parse handwritten text in different formats
- Tested accuracies of various methodologies to differentiating between intentional marks and bad scans, eventually deciding on SciPy stats to compare against a blank document copy and employing a histogram to determine statistical significance

PROJECT HIGHLIGHTS

AI Dungeons and Dragons Twitch Bot

Python

- Built a Twitch Chatbot and widget for a hackathon using ReactJS, Python, the Twitch API, and OpenAI to act as a multiplayer turn-based text adventure game that leverages OpenAI's Dall-E and ChatGPT APIs

SharePoint Chatbot using Microsoft Bot Framework SDK

C#

- Created demo SharePoint website and chatbot using enterprise licenses and free trials with Microsoft's Power Platform.
- Implemented bot in both C# and Microsoft Power Virtual Agents, connecting bot to other services through Azure Bot Service

Clinical Sense Disambiguation Project with University of California San Francisco research lab

Python

- Collaborated with UCSF on deriving clinical research abbreviations using T5, BioBERT, and GPT-3

Healthcare Review Analysis through Topic Modelling

Python

- Performed Latent Dirichlet Allocation (LDA) Topic Modelling on Healthcare review corpus to analyze feedback for hypothetical business
- Wrote analysis of performance increases by cleaning and fine tuning the corpus with stop words removal, lemmatization, and stemming

Sentiment Analyzer

Python

- Wrote a program in Python to classify text as positive or negative using supervised machine learning and the NLTK library
- Implemented stop word list, Laplace smoothing, and stemming to improve performance of bigram model, with test accuracy of 89%