

# Akshay Satish

West Lafayette, IN  
akshaysatish1998@gmail.com  
(765) 701-9653

<https://www.linkedin.com/in/akshay-satish>  
<https://github.com/akshysatish>

## Summary

---

Computer Science graduate student and aspiring Machine Learning Scientist with expertise in Data Analysis, Machine Learning (ML), Natural Language Processing (NLP), and NoSQL databases. Proficient in Python, SQL, R, C++, and Julia. Skilled in Pandas, Scikit-learn, PyTorch, TensorFlow, and other ML libraries.

## Education

---

<b>Purdue University</b> <i>Masters in Computer Science</i>	August 2021 – Present <i>West Lafayette, IN</i>
<b>Nitte Meenakshi Institute of Technology</b> <i>Bachelors in Technology, Computer Science</i>	August 2016 – May 2020 <i>Bangalore, India</i>

## Project & Research Experience

---

### Implementation of a Document Database Jan 2023 – April 2023

*Purdue University*

- Collaborated with a team of developers to design and implement a NoSQL document database from scratch using Python, with support for CRUD operations, B+ Tree indexing, and concurrency.
- Utilized Multi-Version Concurrency Control to allow multiple transactions to read and write to the database simultaneously without interfering with each other while maintaining data consistency.
- Improved query speeds by 50% with 200 microseconds to 1 second query time for sizes ranging from 10 documents to 1 million documents respectively for complex queries with filtering and projection.
- Documented the database architectures and API, including examples of how to use the database for common use cases, to facilitate ease of use and adoption as libraries by other developers on the team.

### Survey of Document Databases Aug 2022 – Dec 2022

*Purdue University*

- Conducted a comprehensive survey of NoSQL document database modeling, storage, operations, indexing, sharding techniques and communicated the results
- Inspected data structures used to design storage engines and indexes in disk and in-memory databases
- Communicated detailed diagnosis of JSON-based encoding in databases, advantages, and disadvantages

### Predicting Earthquake Trends Jan 2022 – April 2022

*Purdue University*

- Extracted and Analyzed geospatial data of 18000+ earthquakes to prepare for prediction model
- Implemented DBSCAN to perform spatial clustering based on the intensity of earthquakes
- Predicted earthquake magnitude trends using LSTM model and visualized the results as a heatmap to communicate high-risk regions based on depth and magnitude

### Graph-based keyword extraction Mar 2020 – May 2020

- Built NLP tool to extract relevant keywords and keyphrases from text data via LSTMs in PyTorch
- Applied k-core truss decomposition to build a word graph and extract related keywords
- Decreased error by 8% as compared to supervised and TF-IDF methods
- Collaborated and co-authored a conference paper on graph-based keyword extraction for twitter data

## Sentiment Analysis of Tweets

Jan 2020 – Mar 2020

- Extracted and organized 1000+ tweets relevant to a topic by mining tweets based on a search query
- Constructed tokenized word embeddings and attention mappings to improve language tasks
- Built NLP tool using the BERT model to summarize tweets improving by 15% over Word2Vec
- Implemented sentiment analysis to classify positive, negative, and neutral tweets

### *Specialized Skills*

---

**Machine and Deep Learning:** Pandas, Scikit-learn, Seaborn, PyTorch, Keras, Tensorflow, LSTMs

**Programming:** Python, SQL, R, C++, Julia, Latex

**Databases:** SQL, MySQL, BigQuery, NoSQL

### *Research Presentations*

---

Graph-Based Keyword Extraction for Twitter Data - Emerging Research in Computing, Information, Communication and Applications Conference, June 2022

- Co-authored and presented a paper on graph-based keyword extraction for Twitter data, which was published in the conference proceedings.
- Designed and conducted experiments to evaluate the effectiveness of the proposed approach, which achieved an 8% reduction in errors compared to traditional methods.