Akash Saravanan

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Education

- **Anna University (Sri Venkateswara College of Engineering)** — Chennai, India
  Bachelor of Engineering in Computer Science and Engineering; First Class. — *Jun. 2015 – Apr. 2019*
  - **Relevant Coursework**: Artificial Intelligence, Information Retrieval, Design and Analysis of Algorithms, Graph Theory and Applications, Discrete Math, Transforms and Partial Differential Equations, Probability and Queuing Theory.

Research Experience

- **Beating Battleship: A Comprehensive Analysis** — Chennai, India
  Independent Research Project (In Progress) — *Jun 2019 - Present*
  - **Summary**: A complete study on the strategy game of Battleship. Generated 1,000,000 different board positions to test algorithms on. Experimenting with 4 broad algorithms - random, parity-based, probability-based (including Monte Carlo simulations) and reinforcement learning. Each algorithm is further augmented with heuristics & randomness when applicable.
- **Natural Language Generation using Generative Adversarial Networks** — Chennai, India
  Undergraduate Thesis — *Dec 2018 - Apr 2019*
  - **Intra-Mural Funding**: Our proposal was the only one granted intra-mural funding of Rs. 10,000 from nearly 90 teams in the department.
  - **Summary**: Performed a comparative study of existing text generation methodologies. Established a baseline performance by allowing the network to write short paragraphs after independently training each model on (1) "Alice in Wonderland" and (2) "The Adventures of Sherlock Holmes". Developed a Generative Adversarial Network (GAN) using an LSTM generator and a fully connected discriminator. While the network generated coherent sentences, sequence models and transformers retained the best performance.
- **Facial Emotion Recognition using Convolutional Neural Networks** — Chennai, India
  1st International Symposium on Artificial Intelligence & Computer Vision (AICV'18) — *Feb 2018 - May 2018*
  - **Single Blind Peer Review**: Presented on 28th September 2018. Published in the conference proceedings.
  - **Summary**: State-of-the-Art models utilized large datasets with large models complex architectures. We proposed a new CNN model that utilized a simple architecture & a small dataset to achieve near State-of-the-Art accuracy (0.60) on the FER-2013 dataset.

Work Experience

- **Mad Street Den (Vue.ai)** — Chennai, India
  Engineering Trainee — *Aug 2019 - Present*
  - **Product Attribute Classification**: Worked on an intelligent product attribute classification engine to deliver over 30 attributes per week across multiple product types. Deployed systems on Amazon Web Services (AWS) & Google Cloud Provider (GCP) and optimized the codebase to reduce latency by 10% - 60% across the board. Presently developing a neural network classifier to complement the engine.
  - **Named Entity Recognition**: Created a Named Entity Recognition system using a pre-trained BERT model to identify key entities in new client catalog data. Manually annotated 2,000 products to form a training and testing dataset. Achieved an F-Score of 0.95+ for each entity.
  - **Text Generation**: Developed a Sequence-to-Sequence (Seq2Seq) model for automated generation of product descriptions. Utilized LSTM layers for both the encoder and the decoder. Trained custom word embeddings on a large corpus to represent input data for the model.
- **Mad Street Den (Vue.ai)** — Chennai, India
  Engineering Intern — *May 2019 - Aug 2019*
  - **Word Embeddings**: Implemented the Word2Vec algorithm on a catalog of 2 million fashion retail products for use in text generation, named entity recognition and classification tasks.
  - **Keyword Extraction**: Analyzed 37 million fashion retail products across 15 clients to extract important keywords per product type. Implemented Normalized Pointwise Mutual Information (NPMI) to identify bigrams and designed a modified TF-IDF algorithm that accounted for the different product types in a catalog.

- **CPC Diagnostics Pvt. Ltd.** Chennai, India
  Software Development Intern - Python *Nov 2017 - Jan 2018*
  - **Patient Management System**: Automated the paper-based patient management system by developing an end-to-end system. Used Python to remotely interface with medical instruments, retrieve data and map it to existing patients within a SQLite Database.
  - **Report Generation**: Developed an analytical tool to automatically process test data, identify abnormal parameters create graphs, & generate a hematology report for use by medical professionals.

Projects

- **PokéGAN**: An exploratory project into Generative Adversarial Networks (GANs) for generating new Pokémon using data from the Pokémon video games. (PyTorch)
- **pH7**: Collaborated with a team of 6 to build a dynamic social platform that provided gamified & personalized healthcare for our Smart India Hackathon 2019 project. Created a custom food dataset and achieved 87% accuracy on a CNN classification model. Developed the back-end and setup database access via an internal API. (Keras, Flask, Scrapy)
- **Whatsapp Message Analyzer**: Analyzes WhatsApp group chats to generate statistics and graphs on user activity, frequent words etc. (Python, Seaborn)
- **Conway's Game of Life**: Implemented a fully functional cellular automaton, The Game of Life. (Python)
- **Reddit Comment Analysis Bot**: Designed a bot to analyze a user's comment history and provide facts and graphs about their activity. (Python, PRAW, MatPlotLib)
- **Unbeatable Tic Tac Toe**: Developed using the Minimax algorithm. (Javascript, HTML, CSS)

Programming Skills

- **Languages & Databases**: Python, Javascript, HTML, CSS, C, C++, Markdown, MySQL, SQLite, Redis, MongoDB.
- **Frameworks & Libraries**: PyTorch, Tensorflow, Keras, NumPy, Pandas, scikit-learn, Flask, Django, Bootstrap.
- **Tools & Technlogies**: Git, LaTeX, Amazon Web Services (AWS), Google Cloud Platform (GCP), Adobe Photoshop.

Certifications

- **DeepLearning.ai** *Oct 2019*
  Coursera Five Course Specialization on Deep Learning.
  - **Neural Networks and Deep Learning**
  - **Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization**
  - **Structuring Machine Learning Projects**
  - **Convolutional Neural Networks**
  - **Sequence Models**
  - **Selected Course Projects**: Object Detection, Neural Style Transfer for Art Generation, Face Recognition, Character-Level Name Generation, Sentiment Classification with Emoji, Neural Machine Translation.
- **FreeCodeCamp Front End Development Certification** *Apr 2017*
  400 Hours of Coursework on HTML, CSS & Javascript.

Academics & Professional Service

- **Peer Reviewer**: The Journal of Supercomputing, Springer Nature. *Dec 2018 - Present*
- **Mentor**: Yet Another Hackathon 2K19, Chennai, India. *Sep 2019*
- **Chairman**: Sri Venkateswara College of Engineering, ACM Student Chapter. *Jun 2018 - May 2019*
- **Seminar**: 'Welcome to CS! Now What?', Sri Venkateswara College of Engineering. *Feb 2019*
- **Review Panel**: The Knowledge Initiative: Project Presentation, Sri Venkateswara College of Engineering. *Dec 2018*
- **Seminar**: 'Data Privacy & Password Security: Best Practices', Sri Venkateswara College of Engineering. *Sep 2018*
- **Executive Member**: Sri Venkateswara College of Engineering, ACM Student Chapter. *Jun 2016 - May 2018*

Honors & Awards

- **Finalist**: Smart India Hackathon 2019, Coimbatore, India, *Mar 2018*
- **Winner**: Hatch-a-thon 2017, Chennai, India *Mar 2017*

Other Interests

Quizzing, Tabletop, Board & Card Games (both playing & designing!), Video Games, and Reading.