Akshay Bhatia

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RESEARCH INTERESTS

Natural Language Processing, Statistical Modelling, Computer Vision, Algorithms and Optimization Techniques

EDUCATION

University of California, Merced   Merced, CA, USA
Master's of Science in Electrical Engineering and Computer Science(EECS)   *Aug. 2021 – May 2023(Expected)*
Advisor: Shawn Newsam

Jaypee Institute of Information Technology   Noida, UP, India
B.Tech, Electronics & Communication Engineering(ECE)   *Aug. 2014 – June 2018*
Thesis: Real-time control of Zigbee for Smart Shopping System using RFID

WORK EXPERIENCE

Computer Vision Lab, UC Merced   January 2022 - Present
Research Member   *Merced, USA*
Supervisor: Shawn Newsam

- Working on devising semi-supervised learning algorithms for Image Captioning and Visual Question Answering for Geospatial and Remote Sensing Imagery data.

Knorex Pte. Ltd.   April 2019 - July 2021
Research Scientist I - NLP   *Pune, India*
Supervisor: Jin Yiping

- Worked on training and evaluating text classification and text generation algorithms for Knorex KAIROS, improving overall CTR on an average advertising campaign by 12%. Work published at NAACL SRW 2021.
- Built Sentinel: Intelligence-as-a-Service Platform for Content Moderation at Scale, an Active Learning platform to build text classifiers without labeled data - a research grant project supported by Enterprise Singapore.
- Improved existing Transformer models with delexicalisation and entity masking for automatically generating high quality advertising slogans for Dynamic creative optimization, surpassing previous benchmark results by 33%. Work published at Natural Language Engineering - Cambridge University Press 2021

CampK12   May 2018 - Dec. 2018
Machine Learning Developer Intern   *Gurugram, India*
Supervisor: Anshul Bhagi

- Worked on LingoLens, a K12 language learning mobile app powered by a real-time on-device custom YOLO object detection model to detect ∼150 objects with an mAP of 67% and deployed using the TensorFlow Lite engine.
- Subsequently optimized the on-device detection and classification inference speeds by 19% by porting the detection model to a C++ backend.
- Implemented embedding and attribute-aware similarity models for the automatic question tagger system for the peer to peer question answering forum for the CampK12's Generation Blockchain 2018 Summit.
- Co-designed and co-instructed CampK12's first Machine Learning & AI course 2018.

Spikeway Technologies Pvt. Ltd.   May 2017 – July 2017
Machine Learning Intern   *Noida, India*
Supervisor: Praveen Kumar

- Led a 3 member team for the development and deployment of a ML-based Book Genre Classification system to classify books into their genres, based entirely on its title, without knowledge of author and origin. Deployed the trained models with Kubernetes' containers and pods in production.
- Collaborated with the backend team on the prototype of a News Article Authorship Plagiarism Checker using a word embedding vector similarity approach.

PUBLICATIONS

Seed Word Selection for Weakly-Supervised Text Classification with Unsupervised Error Estimation
Jin Yiping, **Akshay Bhatia**, Dittaya Wanvarie
NAACL SRW 2021 — arXiv / Paper

Toward Improving Coherence and Diversity of Slogan Generation
Jin Yiping, **Akshay Bhatia**, Dittaya Wanvarie, Phu T. V. Le
Natural Language Engineering, Cambridge University Press 2021 — Preprint

MANUSCRIPTS

Sentinel: In-House Active Learning Platform
Akshay Bhatia, Vishakha Kadam, Jin Yiping, Tho Nguyen
In progress, 2021 — Paper

TEACHING EXPERIENCE

CSE 005 - Intro to Computer Applications   Jan. 2022 - May. 2022
Graduate Teaching Assistant, University of California Merced, Spring 2022

CSE 120 - Software Engineering   Aug. 2021 - Dec. 2021
Graduate Teaching Assistant, University of California Merced, Fall 2021

CSE 031 - Computer Organization   Aug. 2021 - Dec. 2021
Graduate Teaching Assistant, University of California Merced, Fall 2021

RELEVANT PROJECTS

Drone Fault Detection Based on ROS Topics   Aug. 2021 - Dec. 2021
Course Project for EECS 283: Advanced Topics in Intelligent Systems with Azin Shamshirgaran

- Explored the domain of external and internal fault detection systems for autonomous UAVs and drones. Main contributions included gathering and labeling of sensory data using a Parrot Bebop 2 drone and experimenting with variations of ordering techniques to enhance CNN models for 1D sensory data.
- Improved vanilla CNNs using upsampled ordering for sensory data with inclusion of novel features, outperforming classical machine learning and existing heuristics' based algorithms with an AUC-ROC score of 94.3%.

Road Network Extraction   July 2018 - Aug. 2018
Movehack Global Mobility Hackathon 2018

- Road network segmentation and extraction system using high resolution satellite imagery for low cost terrain monitoring and infrastructure assessment. Implemented the U-Net model using Python and FastAI on the Mnih Massachusetts dataset.
- Optimized the trained model for real-time applications with final inference speed of only 0.28 seconds on Tesla K80 GPU achieving a mask accuracy of 95% and a dice score of 65% on the validation set.

TravelCamp   Nov. 2016 - Dec. 2016
Submission for IMAD 2016 - Live Demo

- A social blog/profile web app developed for IMAD 2016 built with NodeJS, ExpressJS, MongoDB, PassportJS.
- The web app follows RESTful approach for CRUD operations and was deployed using Heroku.

RELEVANT COURSEWORK

Object Oriented Systems and Programming, Data Analysis using R, Unix Programming, Data Structure and Algorithms, Algorithm Analysis and Design, Modern Applied Statistics, Advanced Topics in Intelligent Systems, Cloud Computing

TECHNICAL SKILLS

Languages: C++, Java, Python, R
Frameworks/Databases: Tensorflow, PyTorch, Pandas, OpenCV, NumPy, Scikit-learn, NodeJS, Flask, MongoDB, MySQL
Developer Tools: Git, AWS, Docker, LaTeX, Kubernetes

REFERENCES

Prof. Ravinder Ahuja

Assistant Professor, Computer Science & Engineering, Galgotias University, Noida, India(Previous: Professor, CSE, JIIT)

🌐 *homepage* ✉ *email*

Jin Yiping

Senior Research Scientist, Knorex Pte. Ltd., Bangkok, Thailand

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Anshul Bhagi

CEO & Co-Founder, CampK12, Gurugram, India

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