

Viren Khandal

Portfolio: virenkhandal.github.io
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EDUCATION

- University of Berkeley, California** Berkeley, California
Bachelor of Arts - Computer Science & Applied Mathematics; GPA: 3.7 Aug 2019 - May 2022
Specialization: Machine Learning and Artificial Intelligence
Courses: Deep Learning, Machine Learning, Artificial Intelligence, Efficient Algorithms, Data Structures, Modern Statistical and Predictive Analysis, Numerical, Real, and Complex Analysis, Advanced Linear Algebra, Abstract Algebra
- Stanford University, California** Palo Alto, California
Bachelor of Arts - Computer Science; GPA: 3.4 May 2018 - Sept 2018
Courses: Data Mining and Analysis, Client Side Internet Technologies

SKILLS SUMMARY

- Languages:** Python, JAVA, C, C++, JavaScript, Go, SQL, Julia
- Frameworks:** Tensorflow, PyTorch, Keras, Flask, NLTK, SpaCy, NodeJS, ReactJS
- Tools:** GIT, Docker, Shell, AWS, Azure, GCP, IBM Cloud, Web, Arduino
- Soft Skills:** Leadership, Communication, Time Management, Public Speaking, Teamwork

EXPERIENCE

- UC Berkeley College of Engineering - VeHICal** Berkeley, CA
Researcher May 2021 - Present
 - Mentors:** Professor Sanjit Seshia, Professor Bjoern Hartmann, Dr. Yash Vardhan Pant
 - Scope:** Formalizing models for safe autonomous-to-human perception handoffs in autonomous vehicles on the VeHICal project (<https://vehical.org>)
 - Description:** Leading project to improve responsibility of autonomous vehicles through verification of perception decision making by developing unique scoring metric to gauge credibility of reinforcement learning/object detection models (YOLOv3, SSD, RetinaNet)
 - Research Foci:** Human-Computer Interaction, Formal Methods, Machine Learning, and Control Theory
- Computer Science Mentors** Berkeley, CA
Instructor & Coordinator Jan 2020 - Present
 - Mentors:** Professor John DeNero, Professor Christopher Hunn
 - Scope:** Lead weekly tutoring session to teach students about linear algebra, circuit analysis, and machine learning.
 - Description:** Lead a group of 25+ mentors by hosting teaching workshops and promoting a passion for teaching.
 - Impact:** Providing group tutoring for Electrical Engineering Computer Science (EECS) courses at UC Berkeley to 2000+ undergraduate students.
- Hirebee.ai** Remote
Machine Learning Intern Jan 2021 - June 2021
 - Mentors:** Dr. Vahe Tshitoyan, Mrs. Luiza Avetisyan
 - Scope:** Streamlining the HR process by developing NLP-based algorithms for job similarity and candidate progression.
 - Description:** Designed and deployed a multilayered CNN based on Named-Entity-Recognition (NER) to extract categorized skills from resumes and job postings with 95% precision
- InternPursuit** Remote
Machine Learning Intern Jan 2021 - June 2021
 - Mentors:** Dr. Isabella Johnston, Mr. Irving Chin
 - Scope:** Employer platform to manage intern from recruitment to exit. Learning Academy for Employers
 - Description:** Developing a novel optimization and multilayered clustering algorithm to optimally match student and employer profiles
- Cool Climate Networks** Berkeley, CA
Lead Researcher Jan 2020 - June 2021
 - Mentor:** Dr. Christopher Jones, Dr. Daniel Kammen
 - Scope:** Research consortium at the University of California, Berkeley focused on research in developing cutting-edge carbon footprint management tools for communities in the U.S. and Internationally.
 - Description:** Used machine learning tools in R and Python to perform qualitative/quantitative analysis and create analytical maps from US Census Tract data

- WhatElse.io** Berkeley, CA
Backend Development Intern *Sept 2019 - Feb 2020*
 - Mentor:** Mr. Pooran Prasad Rajanna
 - Scope:** A business productivity solution, which saves customer-oriented teams many hours, from searching data in various applications, by providing relevant content when necessary
 - Description:** Utilized Flask and Jinja to create an interactive Python-based web dashboard and demoed it to 100+ VC firms and investors at official Berkeley SkyDeck Demo Day
- Open Networking Foundation** Menlo Park, CA
Software Engineering Intern *June 2018 - Dec 2019*
 - Mentors:** Dr. Guru Parulkar, Mr. William Snow, Mr. Matteo Scandolo
 - Scope:** Operator Led Consortium hosting open source mobile broadband projects driving network industry transformation
 - Description:** Development/Unit testing work to enhance UI for key Internet Service Providers with JavaScript, jQuery, and AJAX

PUBLICATIONS

- Academic Conference Paper: Online Credibility Scoring of Perception Systems for Autonomous Driving:** *(Work in Progress)* A framework to gauge the credibility of an autonomous vehicle's perception module based on a model that scores a neural network's reliability online. **Tech: Python, Tensorflow, TinyYolo, GCP** (In Progress) **Accepted at ICLR CSS Workshop 2022**
- Academic Workshop Paper: Modeling and Influencing Human Attentiveness in Autonomy-to-Human Perception Hand-offs:** *(Work in Progress)* A formal method to model the perception hand-off problem as an optimally-parametrized Markov Decision Process, which schedules proposed active information gathering (AIG) actions. **Tech: Python, Tensorflow** (In Progress)
- Academic Workshop Paper: Exploring Credibility Scoring Metrics of Perception Systems for Autonomous Driving:** *(Work in Progress)* An empirical study on the reliability of object detectors and their points of failure based on realistic, non-adversarial perturbations. **Tech: Python, Tensorflow, TinyYolo, GCP** (December '21) **Accepted at IEEE/ACM COMSNETS Intelligent Transportation Systems 2022**
- Academic Paper: Modeling the 15 Tile Puzzle Through the Lens of Group Theory:** *(Work in Progress)* Developing a mathematical backing for the 15 Tile Puzzle and solving strategies using group and ring theory. (In Progress) **Self-Publish**
- Academic Paper: Modeling the Rubik's Cube Through the Lens of Group and Ring Theory:** *(Work in Progress)* Developing a mathematical backing for the Rubik's Cube and a common solving strategy (F2L) using group and ring theory. (In Progress) **Self-Publish**
- Publication: Consumption Based Greenhouse Gas Inventory of San Francisco from 1990 to 2015:** A consumption-based emissions inventory for the City/County of San Francisco, California from 1990 to 2015. **Tech: R, Python, Data Analysis** (October '20) **Presented at Commission on the Environment - San Francisco**
- Industry Conference Paper: Determining the Causalities of Network Delay and Latency:** An approach using a correlation analysis and machine learning to determine the constituents of network latency. **Tech: Python, R, Tensorflow, Keras** (September '19) **Presented at ONF Connect 2019**
- Industry Conference Paper: The Beginnings of a Search Engine:** An introductory model for a search engine, built on search optimization through a variety of classifiers (SVMs, Random Forests, etc). **Tech: Python, R, TensorFlow, PyTorch** (December '18) **Presented at ONF Connect 2018**

PROJECTS

- Drowsiness Detection System (Computer Vision, Machine Learning):** *(Work in Progress)* AI model to detect/prevent drowsiness in autonomous vehicles. **Tech: DeepLearning4Java, OpenCV, Tensorflow, Android Studio** (August '21)
- Wrapt - (Full-Stack, RESTful API):** Web Application for visualizing Spotify listening activity with Spotify, Twitter, and Instagram integration. **Tech: Python, Flask, JavaScript, API Integration** (February '21)
- MoodMatch - multimedia recommendation system (Machine Learning, NLP, Full-Stack, Web Crawlers):** Multi-platform application for recommending trending music/movies based on user's mood using novel sentimental analysis algorithms. **Tech: Python, NodeJS, NLTK, TensorFlow, Keras, Azure** (October '20)
- BeachBuddy - multimedia recommendation system (Machine Learning, RESTful API, Full-Stack, Web Crawlers):** Multi-platform application for recommending beaches based on several criteria (crowd, weather, distance, etc) using novel clustering algorithm built on PyTorch. **Tech: Python, PyTorch, AWS, Flask** (July '20)

HONORS & AWARDS

- Amazon Web Services **Cloud Practitioner** - *In Progress*
- **First Place Winner** at Global DefHacks Hackathon - July, 2020
- Awarded title of **Computer Science Scholar** at University of California, Berkeley - Sept, 2019
- **Second Place Winner** at Global Amazon Web Services Hackathon, May, 2019