Viren Khandal

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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, JavaScript, Go, SQL
- **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) **To be presented at ICLR 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 Paper: Connect the 15 Tile Puzzle to Group and Ring 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: Connect the Rubik's Cube to 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**
- **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) **IEEE/ACM COMSNETS Intelligent Transportation Systems 2022**
- **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)