# KUNJAL PANCHAL

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## SKILLS

Programming Languages – Python, Java, Matlab, R, C/C++
Web Development – HTML5, JavaScript, CSS3, SQL, Ruby on Rails, Django, Flask, React, RESTful APIs
Tools – Jupyter Notebook, Google Colab, Github, PyTorch and SciPy stack

## EDUCATION

University of Massachusetts – Amherst, Massachusetts Sep 2019 – Expected May 2021

- Master of Science in Computer Science – Research Track
- Relevant Coursework – Computer Vision, Natural Language Processing, Machine Learning, Robotics, Modern Computer Architecture, Advanced Cryptography, Advanced Algorithms

The Maharaja Sayajirao University of Baroda, Gujarat, India Aug 2015 – May 2019

- Bachelor of Engineering in Computer Science
- Relevant Coursework – Artificial Intelligence, Computer Graphics, Advanced Technologies in Database, Client and Server Architecture, Computer Networks, Network Security, Microcontrollers, Advanced Microprocessors, Object Oriented Programming, Software Engineering, Engineering Economics

## WORK EXPERIENCE

**Emotion AI Program Intern** Jul 2020 – Aug 2020
Affectiva

- Developed a prototype for an "Emotion-enable" smart fridge which detects the available food inside a refrigerator with a VGG16 food classifier, detects the mood of the user with Affectiva Facial Expression Recognition SDK and suggests the food ingredients and dishes accordingly
- Trained the food classifier on Freiburg Grocery dataset with the accuracy of 76.16%
- Implemented an incremental learner multiclass classifier decision tree which correlated the mood of the user and what food they are picking up from the fridge
- Familiarized with the skills of market analysis, pitching the project, patent creation as well as honed the technical aspects of data acquisition, data synthesis, affect analysis, and personalization from facial analysis

**Graduate Student Researcher** Apr 2020 – Current
College of Information and Computer Sciences, University of Massachusetts – Amherst
Areas – Machine Learning, Computer Vision, Cryptography, Natural Language Processing

- Built a deep residual network for steganalysis of digital images for ALASKA2 challenge with accuracy of 0.9178 which focused on noise residues and DCT of the JPEG images where there is some secret data hidden
- Developed an efficient algorithm to produce decoy messages for a cryptographic scheme called Honey Encryption to fool an attacker into believing that their brute force attack was successful
- Employed GPT-2 transformers for natural language decoy message generation with success rate of 0.894

**Software Developer Intern** Jun 2018 – Jun 2019
The Maharaja Sayajirao University of Baroda

- Created the simulations and visualizations of inner workings of operating systems and processors in Java
- Utilized JNLP [Java Network Launch Protocol] to make the Java apps render on client-side while using server resources with ~1000 simultaneous connections capacity
- Refactored the database of the learning platform site on which these simulations were embedded, with 60% increase in speed-up efficiency
- Provided a mobile interface for the site which had inherently no support for mobile version of servlet render

## PROJECTS

**SoundCluch** – *https://github.com/Astuary/BoseSoundTouchAPI* Feb 2020

- Winner of "Best use of Bose SoundTouch API" and "Best Hack for Home Accessibility sponsored by Wayfair"
- Enhanced the SoundTouch API in Python, to get the motion sensor inputs within 150 cm with a Raspberry Pi, to sound off a custom audio notification through the Bose speakers with latency as low as 200 ms

**Optimization-based supervised and unsupervised learning models** Sep 2019 – Dec 2019

- Developed augmented versions of outlier minimizing linear and logistic regression, support vector classifiers, a custom neural network with regression and multi-class classification, Laplacian mixture models

## LEADERSHIP

**Campus Leader** – Google Developer Students Club India Dec 2018 – Dec 2019