

# Karthik Pansetty

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## EDUCATION

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- **Carnegie Mellon University** Pittsburgh, PA  
Master of Science in Electrical and Computer Engineering  
*Relevant courses: Intro to Machine Learning for Engineers, Image and Video Processing (Summer 2020) (GPA: 4.0/4.0)*  
*Start Jan 2021*
- **Indian Institute of Technology Gandhinagar (IITGN)** Gandhinagar, India  
Bachelor of Technology in Electrical Engineering  
with minor in Computer Science and Engineering; (GPA: 8.35/10)  
*July 2015 - May 2019*

## SKILLS

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- **Programming Languages:** Python, JAVA, MATLAB, C, SQL, Verilog and Assembly Level Language.
- **Frameworks:** TensorFlow, Keras, PyTorch, Pandas, NumPy, SciPy, Matplotlib, NLTK, OpenCV, Scikit-learn, Networkx, Google Cloud Platform.
- **Interests:** Biomedical Informatics, Computer Vision, Data Science.

## PROFESSIONAL EXPERIENCE

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- **HealthCloudAI** Bangalore, India  
**Machine Learning Engineer** (*Supervisors: Dr. Nitesh Shroff, Dr. Preeti Bhargava*) *July 2019 - April 2020*
  - Developed a Dynamic Graph Convolutional Neural Network (DGCNN) model to predict clinical diagnosis from unstructured clinical text in the health records of patients to improve the quality and effectiveness of patient care.
  - Also developed a model to generate personalized questions and associated symptoms/risk factors based on the demographics and the medical history of patients.
  - Designed and implemented a pipeline consisting of acquiring the medical data, cleaning the data, training models, validating them and deploying them on the Google Cloud Platform.

## RESEARCH EXPERIENCE

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- **GIcST: A Natural Language Framework to Identify Themes Differentiating Cohort Subgroups** (*Supervisors: Dr. Keith Feldman, Prof. Nitesh Chawla*) Notre Dame, IN  
**Research Intern, University of Notre Dame** *May 2018 - June 2019*
  - Developed Generalized Identification of Cohort Specific Themes (GIcST) framework to systematically extract themes differentiating texts of two generalized population sub-groups while accounting for overall population-level experiences.
  - This framework automates the process of discovery of psychological themes with respect to outcomes from unstructured psychological intervention texts paving the pathway for personalizing interventions and to gain insights into the practices surrounding patient conditions and outcomes, aimed to ultimately better inform the quality and effectiveness of care.
- **Graph Based Image Segmentation** (*Guide: Prof. Shanmuganathan Raman*) Gandhinagar, India  
**Summer Research Intern, IIT Gandhinagar** *May 2017 - July 2017*
  - Implemented Binary Image Segmentation in MATLAB by using the graph representation of Simple Linear Iterative Clustering (SLIC) superpixels of an image.
  - Analyzed different methods of Spectral Clustering and understood the graph representation of an image and compared this approach with the traditional K-means clustering.

## PROJECTS

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- **Geometric Deep Learning** (*Guide: Prof. Shanmuganathan Raman*) *August 2017 - December 2017*
  - Explored the deep learning methods in the non-Euclidean structured data such as graphs and manifolds.
  - Analyzed the advantages of using different Geometric deep learning methods over classical deep learning methods.
  - Implemented Graph coarsening and pooling in Python which are used in Geometric Deep Learning methods.

## Course Projects

- **Sentiment Analysis - SemEval2019** (*Course: Natural Language Processing*) *Sep 2018 - Nov 2018*
  - Implemented an LSTM model to classify the emotions of a user based on the context of the textual dialogue between two users for the EmoContext: SemEval-2019 Challenge.
- **Neural Machine Translation** (*Course: Pattern Recognition and Machine Learning*) *May 2018 - July 2018*
  - Implemented Neural Machine Translation using an LSTM model with Bahdanau attention in Python using Tensorflow to translate German to English utilizing the Europarl Parallel corpus.
- **Optical Flow** (*Course: Mathematical Foundations for Computer Vision*) *November 2017*
  - Implemented Horn Shunck and Lucas Kanade methods of determining the optical flow between two images of the same scene at different intervals of time in Python.
- **Iterative Closest Point (ICP)** (*Course: Mathematical Foundations for Computer Vision*) *October 2017*
  - Implemented Iterative Closest Point (ICP) Algorithm in Python to estimate the point correspondences as well as global rotation matrix and translation vector between two 3D point clouds (RGB-D).
- **Face Recognition System** (*Course: Mathematical Foundations for Computer Vision*) *September 2017*
  - Designed a Face Recognition System based on the Eigenfaces method using “AT&T Database of faces” in Python.
  - Implemented Principal Component Analysis (PCA) Algorithm for dimensionality reduction in Python.
- **DES and RSA Encryption** (*Course: Intro to Applied Cryptography*) *March 2017*
  - Implemented DES and RSA Encryption in Python to encrypt text and image as a course project for Introduction to Applied Cryptography.
- **Morse Code Detector in FPGA** (*Course: Digital and Analog Electronics*) *March 2017*
  - Implemented a Morse Code detector in FPGA by using a combination of two Moore Finite State Machines and programming it in Verilog.

## ACADEMIC ACHIEVEMENTS

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- **Dean’s list awardee** for outstanding academic performance, for 4 out of the 8 semesters while at IIT Gandhinagar.
- Qualified in the National Talent Search Exam (NTSE) which is one of the **prestigious exams** conducted by the Government of India in 2013.

## RELEVANT COURSES

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- **Graduate Level:** Intro to Machine Learning for Engineers, Image and Video Processing, Pattern Recognition and Machine Learning, Mathematical Foundations for Computer Vision and Graphics, Natural Language Processing.
- **Undergraduate Level:** Probability and Random Processes, Signals and Systems, Digital Signal Processing, Data Structures, Algorithm Analysis and Design, Introduction to Computational Complexity Theory, Introduction to Applied Cryptography, Ordinary Differential Equations, Number Theory.
- **Coursera Specializations:** Deep Learning by deeplearning.ai, Applied Data Science with Python by University of Michigan, Introduction to Applied Cryptography by University of Colorado.