

Manikanta Reddy D.

Education

- 2017 **Indian Institute of Technology, Kanpur, B.Tech - Computer Sciences.**
(Ongoing) current: 9.5 (cumulative: 8.1)/10
- 2013 **Sri Chaitanya Narayana, Hyderabad, IPE, 96.9%.**
- 2013 **Sri Chaitanya, Hyderabad, SSC, 94%.**

Interests

Computer Vision, Machine Learning, Medical Image Analysis, Natural Language Processing, Astronomical Data Analysis, Artificial Intelligence

Internships

- May–Jun **Microsoft India, Hyderabad.**
- 2016 Worked with the Sales department for building textual bots with conversational intelligence and memory.

Major Projects

- Aug–Nov **On segmentation of Ultrasound Images of Neck, Prof. Harish Karnick, IIT Kanpur.**
- 2016 Worked on segmenting ultrasound images to accurately identify Brachial Plexus.
- Implemented a model based on Autoencoders with redesigned connections to boost high resolution features in the output. This ensured a high level of localization features to be retained in the output.
 - Dream analysis revealed significant improvement in the learning over conventional autoencoders.
 - Proposed a faster second model based on Proposals by sliding windows which under performed slightly.
 - Devised a hack based on PCA to clean the binary outputs without loss in accuracy.
- (Code|Report)
- Jan–Apr 2016 **A Survey On Human Sex Determination Methods, Prof. Harish Karnick, IIT Kanpur.**
- Performed an extensive survey on various methods of determining Human sex using machine learning techniques.
 - Particularly explored methods that include human faces, full body and gaits as feature descriptors.
 - Applied the trained models to IITK's surveillance system to test our online version of sex determination algorithms.
- (Code|Report)
- Jan–Apr 2016 **Multilingual Text to Text similarity, Prof. Arnab Bhattacharya, IIT Kanpur.**
- Devised a algorithmic pipeline to estimate semantic relatedness between multilingual articles over wikipedia without any dictionary based sub systems for translations.
 - The lstm based model while being semi-supervised accurately captured the *sense* and *meaning* of any given piece of text intelligently.
- (Code|Report)
- Jan–Apr 2016 **Dynamic Video Synopsis, Prof. Vinay P. Namboodiri, IIT Kanpur.**
- Generated a dynamic video synopsis with a stroboscopic effect as opposed to a key frame based method by solving a minimization problem over an energy equation.
 - Implemented iterative graph cuts and Loopy belief propagation to optimize the minimization.
- (Code|Report)

- Dec 2015 **On Variables In Globular Cluster NGC 2419** , *Prof. Priya Hassan*, NIUS, MANUU, Hyderabad.
Worked on registering and analyzing astronomical images in globular clusters to aid in detection of Exoplanets.
- Developed automated methods for registering images of NGC2419 from Himalayan Chandra Telescope.
 - Implemented a Discrete Fourier Transforms based algorithm to align images and stacking even with inaccurate prior knowledge of WCS data.
 - Performed Aperture photometry to compute fluxes and zenith angle corrections for atmospheric extinction.
 - Currently working on identifying gravitational microlensing events in light curves for discovering potential Planets in the globular cluster (NGC 2419).
(Code|Report)
- Dec 2013 **Analyzing VHE Gamma Rays From Markarian 421 And Crab**,
Dr. K. K Yadav and Dr. R. C. Rannot, Bhabha Atomic Research Center (BARC), DAE, Mumbai.
Worked on Very high energy Gamma Ray Telescopy to understand phenomenon in a different spectrum of light.
- Developed methods to cleanse low resolution data from TACTIC on Crab Nebulae and MRK421, of cosmic ray events and to estimate the signal parameters and temporal distribution of VHE Gamma Rays from the sources.
 - Key work involved evaluating different models of interference from other sources, parametrizing the image to classify various events and employ cuts to produce results with high recall.
 - Presented a possible verification of current theoretical models of VHE Gamma ray sources.
(Code|Post)

Courses

- IIT Kanpur Machine Learning Techniques, Artificial Intelligence Programming, Computer Vision
Linear Algebra, Probability and Statistics, Abstract Algebra
Discrete Mathematics, Ordinary Differential Equations
Data Structures and Algorithms, Theory of Computation, Programming Logic
Software Engineering, Principles of Data Base Systems, Computer Networks
Operating Systems, Compiler Design, Computer Organization
- Coursera NeuroHacking with R

Hackathons

- May–Aug 2016 **DeepInsight**, *Code.Fun.Do*, Microsoft.
- Built a Microsoft Office Add-In to assist users in their text writing tasks. It uses Machine learning APIs to ease the routine tasks of researching and make them more interesting.
 - The AddIn has received **critical acclaim** on the Finalist Forum of Code.Fun.Do.
 - It has been awarded the **Top Design Idea** and **Top Coding Team** and stood as overall **Winning Team**.
- Oct 2015 **Share Journey**, *Dev Fest*, Google Developers Group.
- Built a comprehensive portal on NodeJS, Express Framework with an AngularJS front end to provide for easy sharing of taxi rides between students of the institute.
 - Placed **1st** in the Google Developer Group's Hackathon.

Technical Proficiency

- Programming C, Python, MATLAB, PHP, javascript, R
- Tools Keras, sklearn, Git, astropy, NLTK, OpenCV, L^AT_EX, ds9, iraf, django

Teaching

- 2014–2015 **Academic Mentor**, *Counseling Service*, IIT Kanpur.
Assisted academically weak freshmen in courses like PHY102, LIF101, ESC101 by conducting classes and personal tutoring.

Scholastic Achievements

- 2013 Secured **AIR 121** in IIT JEE an entrance exam given by over 1.5 lakh engineering aspirants.
- 2011 Awarded **Gold Medal** in IGNOU-UNESCO Science Olympiad, 2011 with a percentile score of 95.08.
- 2015 Awarded **Gold Medal** and placed 1st in the 3rd Inter IIT Tech Meet held in IIT Kharagpur.
- 2012 Placed **37th** in the KVPY Merit list and received a Monetary Scholarship from IISc, Bangalore.
- 2013 Nominated for Aditya Birla Scholarship, one among **40** students from all of India
- 2013 Selected in **top 40** and attended Orientation Camp of International Astronomy Olympiad held in HBCSE .
- 2011 Ranked **10th** in the state in the prestigious South Indian Physics Olympiad
- 2011 Selected in **top 40** and attended the Orientation Camp of International Junior Science Olympiad held in HBCSE .

Responsibility

- Dec 2016 **Grader, Academic Team**, International Olympiad on Astronomy & Astrophysics, Bhubhaneswar.
 - One among 60 members of the Academic Team responsible for Grading the submissions of the prestigious olympiad
 - Also helped in conducting the moderation session and other academic activities smoothly.
- 2014–2015 **Senator, Student Gymkhana**, IIT Kanpur.
 - Elected by an Electorate strength of over 800 students as their representative to the student senate
 - Nominated as the only UG member to the Rules and Procedures Committee
- 2015–2016 **Coordinator, Astronomy Club**, IIT Kanpur.
 - Planned and raised finances, to ensure participation of students in the institute and managed logistics of the club.
 - Actively involved in the construction and management of India's first student built and run Observatory.
- 2013-2014 **Student Guide, Institute Counseling Service**, IIT Kanpur.
 - Mentored 6 freshmen and ensured their smooth transition in to the institute providing personal guidance and one to one mentoring

Other Projects

- May–Jun **Hand Gesture Recognition, Programming club**, IIT Kanpur.
 - 2014 ○ Implemented a Gaussian Mixture model based segmentation technique to extract features of a palm and eliminate illumination based interferences in real time.
 - Built a gesture recognizer based on iterative numerical classifier.
- May–Jun **Fly Tracker, BRaIN**, IIT Kanpur.
 - 2014 ○ Implemented a dynamic background subtraction based model to detect a fly in a petri dish and there by track it.
- Feb–Apr 2016 **Go-Lang To X86 Compiler, Course Project, Compilers**, IIT Kanpur.
 - Built a python based compiler for a subset of GO programming language to x86 Assembly utilizing lex and yacc tools.
 - The implementation includes support for struct data type, N-d arrays, functions and other constructs.
- Aug–Nov **NachOS, Course Project, Operating Systems**, IIT Kanpur.
 - 2015 ○ Implemented the system call library for Fork, Exec, Yield, Sleep, Exit system calls in a skeleton OS.
 - Implemented process scheduling algorithms such as UNIX scheduling, Round Robin, Shortest Job First and Non Preemptive
 - Implemented page replacement algorithms such as Random Page Allocation, FIFO, LRU and LRU Clock

- Feb–Apr 2014 **Robo Wars**, ACA, IIT Kanpur.
- Built a console oriented game, inspired by a classic game Logo.
 - The main work in the development was dealing with input from user, which as well include complex constructs, and make it understandable to the system, and also algorithms for health, shield and fire arms were developed to incorporate into the game.
 - The programming uses turtle module for graphics and python as main scripting language
- May–Jun 2014 **Analysis of Radio data from Supernovae and Estimation Hubble's constant**, *Astronomy Club*, IIT Kanpur.
- Utilised various data analysis and simulation tools like R, ds9, Vireo, etc
 - Analysed Redshifts from numerous galaxies and compared them against standard candles to estimate distances and velocities and predicted Hubble's constant within theoretical limits.
 - Analysed Radio data from supernovae to understand elemental composition of the remnant
- Aug–Nov 2014 **Carnival of Rust**, *Course Project, Manufacturing Processes*, IIT Kanpur.
- A project by our Team was adjudged to be the Best Sectional Project in the course TA201
 - The project involved modeling an amusement park utilizing many industrial processes varying from casting, welding, shearing, etc