Kalpesh Pradeep Dusane
Computer Science & Engineering
Indian Institute of Technology Bombay

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M.Tech.
Male
DOB: 08/07/1994

Examination	University	Institute	Year	CPI / %
Post Graduation	IIT Bombay	IIT Bombay	2019	0.00
Undergraduate Specialization : Computer Engineering				
Graduation	Savitribai Phule Pune University	Sinhgad Academy of Engineering	2015	72.41
Intermediate/+2	Maharashtra State Board	E.S.Andrades College of Science	2011	86.00
Matriculation	Maharashtra State Board	Utkarsha Vidyalaya	2009	90.92

WORK EXPERIENCE

- **Cognizant Technology Solutions**
  Programmer Analyst Trainee, Chennai *(September 2015 - September 2016)*
  - **Content Management System**
    - Full-stack design and implementation for a web application using the Agile technique
    - Incorporated Kendo UI framework and improved the front-end functionality of a web application
    - Implemented in C# .NET using SQL Server and MVC. Managed using Team Foundation Server
  - **E-Learning Platform**
    Developed a whole module related to collecting and displaying the results of tests taken by any trainee
- **Persistent Systems Ltd.**
  Project Intern, Pune *(June 2014 - April 2015)*
  Implementation of Seam Carving for Image Retargeting using CUDA enabled GPU
  - Developed a windows application (in Microsoft visual studio) using **CUDA C++** which reduced the size of an image by the content-aware image resizing algorithm called **Seam Carving**
  - Demonstrated the difference between executing a sequential approach on CPU & a parallel approach on GPU
  - Achieved $\sim$**7.5**$\times$ acceleration in the GPU execution time compared to CPU due to a high degree of parallelism

POSITIONS OF RESPONSIBILITY

- **Interview Coordinator, Placement Team IIT Bombay** *(December 2017)*
  - Assisted in the placement of **1600** students within a team of **200** students during 2017-18 placements season
  - Aided 7 companies in organizing interview process seamlessly during 2017-18 placements
  - Acted as Sole Point Of Contact(SPOC) for 3 companies and ensured smooth functioning of interviews
- **Teaching Assistantship, IIT Bombay**
  - **CS663: Fundamentals of Digital Image Processing**
    (under Prof. Suyash Awate & Prof. Ajit Rajwade) *(August 2018 - November 2018)*
    - Worked with a team of 7 other TAs to evaluate assignments, quizzes, and semester exams
    - Assisted students to resolve their difficulties via Moodle discussion forum
  - **CS101: Computer Programming & Utilization**
    (under Prof. Umesh Bellur & Prof. Krishna S) *(August 2017 - April 2018)*
    - Mentored 14 students each semester and cleared their doubts in weekly labs
    - Evaluated graded labs, examination papers and assisted in conducting examinations of **450+** students

ACHIEVEMENTS AND ACTIVITIES

- Scored **99.84** percentile in **GATE 2017** CS/IT amongst 96,878 candidates *(2017)*
- Ranked **2nd** in the batch from Computer Science Department in Bachelor's final year *(2015)*
- Secured **2nd** prize for the bachelor's project in Project competition held by CSI student Chapter *(2015)*
- Among **top 1%** students in HSC(12^{th} examination) of Maharashtra state board *(2011)*
- Sho Dan (**Black Belt**) in Shotokan Karate Style from Japan Karate Association(JKA) *(2009)*
- Participated in **5km Cycling, 5km Crossy running** at PG Sports IIT Bombay *(2017-2018)*
- **Hobbies:** Solving 9$\times$9 Sudoku and Rubik's Cube, Watching Football matches and Anime

MTech Project and Seminar

- **Scaled Topography from the video sequence of Underwater Images**
  M.Tech Project, Guide: Prof. Ajit Rajwade *(May 2018 - Ongoing)*
  - Explored the mathematics behind the various methods of estimating the equation of an underlying plane
  - Used feature point tracking algorithm which were implemented using Siamese Convolution Neural Network
  - Applied knowledge of the trajectories of feature points obtained from tracking algorithm to estimate the depth of underwater image in the various ground structure such as piece-wise constant or planar structure
- **Restoration of Underwater Images**
  M.Tech Seminar, Guide: Prof. Ajit Rajwade *(January 2018 - April 2018)*
  - Conducted literature Survey about the effect of dynamic refraction on the sine wave in the distorted images
  - Surveyed various water surface shape reconstruction methods such as optical flow based method, learning model-based method, and motion blur model-based method
  - Simulated video of underwater images in presence of circular ripples and mixture of circular ripples

Technical Skills

- **Languages**: C, C++, C#, Python (SKlearn, Pandas, Numpy, Matplotlib, PyTorch), MATLAB
- **Web Development**: HTML, CSS, JavaScript, JQuery
- **Tools**: Git, Microsoft Visual Studio, LaTeX

Course Projects

- **Multi-label Classification on Satellite Images of the Amazon Rainforest**
  (Computer Vision, Guide: Prof. Arjun Jain) *(February 2018 - April 2018)*
  - Solved the Multi-label Image Classification problem using Encoder **Convolutional Neural Network(CNN)** for the feature extraction and Decoder **Recurrent Neural Network(RNN)** for predicting actual labels
  - Explored attention mechanisms on CNN output which result in our highest **F2 score of 90.25** tested on kaggle
- **Inferring Basis Mismatch in Image Representations**
  (Advanced Image Processing, Guide: Prof. Ajit Rajwade) *(March 2018 - April 2018)*
  - Empirically in Compressed sensing, the problem of Basis mismatch occurs because of the two main reasons such as the noise or the discrete representation of bases
  - Implemented the method of Alternating Convex Search(ACS) which uses standard l_1-minimization to find the signal model coefficients followed by a maximum likelihood estimate of the signal model
- **Implementation of CNN and RNN from scratch in Lua Torch7**
  (Computer Vision, Guide: Prof. Arjun Jain) *(February 2018 - March 2018)*
  - Executed the convolutional layer and implemented the backpropagation of Convolutional Neural Network
  - Implemented forward and back propagation of single hidden layer Recurrent Neural Network(RNN)
- **Automatic Image Colorization**
  (Fundamentals of Digital Image Processing, Guide: Prof. Ajit Rajwade & Prof. Suyash P. Awate) *(November 2017)*
  - Converted the training images to LAB colorspace then framed the task as a regression task and trained simple neural network, the neural network with SURF features in scikit-learn
  - Trained Convolutional Neural Network(CNN) to predict the AB space given the grayscale image as input
- **Credit Card Fraud Detection System**
  (Foundations of Machine Learning, Guide: Prof. Ganesh Ramakrishnan) *(November 2017)*
  - Solved binary classification problem by applying various machine learning models like Logistic Regression, Support Vector Machine, Neural Network(NN), Random Forest classifiers with hyperparameter tuning
  - Detected fraud with **Recall of 0.85** using **Random Forest** by addressing the problem of skewed data set
- **Devanagari Character Recognition using Feed Forward Neural Network in Tensorflow**
  (Artificial Intelligence, Guide: Prof. G. Sivakumar) *(November 2017)*
  - Objective was to recognize 46 handwritten Devanagari characters present in 28 x 28 PNG image using NN
  - Achieved **98.68%** accuracy after training a single hidden layer neural network on 92000 samples

Courses Taken

Foundations of Machine Learning	Advanced Image Processing	Artificial Intelligence
Learning Analytics and Educational Data Mining	Advanced Machine Learning	Computer Vision
Fundamentals of Digital Image Processing	Algorithms and Complexity	