

# Remaldeep Singh

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## Summary

- 5 years of software development experience with C++ and Java. 2 years of parallel programming experience in computer vision with Nvidia CUDA and map reduce in medical imaging.
- Experience in machine learning techniques along with image segmentation and special interest in computer vision.
- Proficient in GPU programming with multi GPU image processing algorithm development.
- Proactive and dedicated team player with strong communication and interpersonal skills.

## Technical Skills

Courses: **Machine learning** course from Stanford University.  
Languages: C, C++, Python, Matlab, Pandas, Scikit-learn, Tensorflow, Nvidia CUDA, Java, OpenCV, Qt library, JavaScript, HTML.  
Tools: Git, SVN, Cmake, Microsoft Visual Studio, PyCharm, IntelliJ, UDK Editor, Eclipse, Adobe Lightroom.

## Education

### University Of Utah

Aug. 2017 - May. 2019

MS IN COMPUTER SCIENCE

Utah, USA

- GPA: 3.8
- Courses
  - Machine Learning
  - Data Mining
  - Image Processing
  - Computer Vision
  - Natural Language Processing

### Panjab University

July. 2008 - May. 2012

BE (COMPUTER SCIENCE AND ENGINEERING)

Chandigarh, India

- Graduated in first division with honors. 78.5% equivalent to GPA 4.0
- Courses
  - Engineering Mathematics I
  - Engineering Mathematics II
  - Algorithms design
  - Data Structures
  - Computer Architecture
  - Operating Systems
  - Object Oriented Programming

## Experience

### University of Utah

Jan. 18 - Present

RESEARCH ASSISTANTSHIP

Salt Lake City, Utah

- Developing C++, Java JNI bridging for calling ImageJ routines from the application Fluorender thereby offloading the format reading part to ImageJ.
- Performance optimization and enhancing Fluorender by using multiple threads to do the file reading.

### ADITYA IMAGING INFORMATION TECHNOLOGIES

Mar. 16 - July. 17

SENIOR SOFTWARE ENGINEER (HIGH PERFORMANCE COMPUTING)

Mumbai, India

- Developed GPU algorithms in C++ using Nvidia CUDA for image processing multi-resolution medical images.
- Optimizing algorithms and saving memory requirements by moving towards floating point 16 calculations.
- Designed and developed end to end Java HPC framework for multiple CPU's with multiple GPU's for Leica tissue scanners.
- Scaled multi-resolution image processing algorithms to work on multiple GPU's with multiple CPU's.
- Used machine learning models like **random forest** for final classification of images.
- Assisted in deep learning framework development, primarily used for segmenting regions in tissue slides.
- Reduced the abnormality detection time on pathological images from 5 mins to 2 mins.

### NUITEQ

Sept. 13 - Mar. 16

SOFTWARE ENGINEER

Bangalore, India

- Developed and maintained the in-house software - Snowflake SDK built with C++ and Qt. Built 2 games and 4 application during my tenure.
- Initiated an individual research project encompassing the areas of Open CV and Face recognition with the aim to build a prototype that could recognize faces of the employees of the company. The project was successful and got recognition from the founders.
- Undertook various hackdays (wherein employees are allowed to work on a project of their choice) related to computer vision:
  - Optical character recognition using Tesseract.
  - Object recognition using OpenCV.

## INFOSYS

Jul. 12 - Aug. 13

### SYSTEM ENGINEER

Mysore, India

- Worked on migration of web portals using Teamsite (content migration system) in the Carefirst Team.
- Created CMS components and templates that could be reused for creating web pages. Dynamic components were also created to query data at runtime for a specific user.
- Used open-deploy for publishing web pages.

## GOOGLE SUMMER OF CODE 2011

May. 11 - Aug. 11

### SUMMER INTERNSHIP

Online Engagement, India

- Selected as a GPU developer for NUI-Group under the GSOC program.
- Developed cross-platform GPU library, for image processing using Nvidia CUDA and C++.
- Reduced the processing time of each video frame from 2 mins to 30 secs with GPU.
- Incorporated the GPU library in the CCV (Community Core Vision). Spent considerable time on developing parallel algorithm for a blob detection and labeling, which was later achieved through connected component labeling (CCL) technique.

## Projects

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### Searching for Higgs-Boson Particles Using Machine Learning Techniques

University Of Utah

#### FALL SEMESTER PROJECT

Oct 17 - Dec 17

- Employed classification algorithms like **deep neural networks (tensorflow)**, **logistic regression** and **decision trees (scikit-learn)** using python on the UCI Machine Learning 'HIGGS Data Set' to predict whether an output signal from a collider, is a Higgs-Boson Particle signal or simply background noise.
- Achieved the accuracy of 76% with a deep neural network of 9 layers and 72% with boosted decision trees.

### Scene Understanding

University Of Utah

#### SPRING PROJECT

Feb 18 - Present

- This project is about edge/object segmentation in stereo images.
- I have used Belief Propagation algorithm to get the depth information from the disparity map generated with the algorithm.
- Currently I am using **deep learning/Caffe and belief propagation** in conjunction to improve the segmentation accuracy.

### Face morphing

University Of Utah

#### FALL SEMESTER PROJECT

Oct 17 - Nov 17

- The goal of this project is to smoothly morph one face to another face using the thin plate spline, radial basis function. Morphing combines both shape and color of reference images. It is pretty similar to what you see in movies when a face morphs into another character. The code for this is available on my github account mentioned on the top of the page.

## Extracurricular Activities

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- Organized TED\*Chandigarh.
- Landscape Photographer. Know more on Instagram @remaldeep.
- Work actively in community kitchens (Seva) at Gurudwaras serving food to people from different walks of life.