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	Image Processing	Natural Language Processing
Data Mining	Computer Vision	

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	Algorithms design	Computer Architecture	Object Oriented Programming
Engineering Mathematics II	Data Structures	Operating Systems	

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 enchancing 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

System Engineer

Jul. 12 - Aug. 13

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

Summer Internship

May. 11 - Aug. 11

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

Searching for Higgs-Boson Particles Using Machine Learning Techniques

Fall Semester Project

University Of Utah

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/Segmentation

Spring Project

University Of Utah

Feb 18 - Present

- This project is about edge/object segmentation in stereo images.
- I am using CASENet (Deeply supervised network) to detect the edges and get probabilisitc values for edge pixels.
- Using Belief Propagation on top of edge probabilities I refine the CASENet output and achieve better results for segmentation than CASENet.

Face morphing

Fall Semester Project

University Of Utah

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. A video showcasing the project is available on my website (link at the top of resume).

Extracurricular Activities

- Organized TED^X 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.