

# Non-negative matrix factorization for classifying the defects on steel surface using Convolutional Neural Network

MSc Research Project  
Data Analytics

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Project Submission Sheet  
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# Configuration Manual

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## 1 System Specification

### 1.1 Hardware Configuration

Processor: Intel(R) Core(TM) i5-9300H CPU @ 2.40GHz  
System type: 64-bit Operating System, x64-based processor  
Installed memory (RAM): 16.0 GB  
GPU: NVIDIA Geforce GTX 1050  
Storage: 1 TB HDD  
OS: Windows 10

### 1.2 Software used and Library Versions

Python is used for coding on anaconda with Spyder. Below is the list of libraries with python version.

Python = 3.7.4  
Opencv-python = 4.1.2.30  
glob = 0.7  
numpy = 1.16.5  
path.py = 12.0.1  
scipy = 1.3.1  
keras = 2.3.1  
Keras-preprocessing = 1.1.0  
scikit-learn = 0.21.3  
scikit-image = 0.15.0  
matplotlib = 3.1.0  
pandas = 0.25.1  
seaborn = 0.9.0  
tensorflow-gpu = 2.0.0

For this research we have installed tensorflow-gpu. The prerequisite for installing of tensorflow as follows.

1. First uninstall all the NVIDIA drivers
2. Install Visual Studios Community version

3. Install CUDA : But before you install cuda check the version of cuda that is supported by tensorflow and also check the NVIDIA Graphics card is supported or not for installing tensorflow.
4. After installing the CUDA, install cuDNN of the same version as of cuda otherwise it will not work. A zip file will be downloaded, unzip it and it will contain 3 folders bin, lib and include. open the C:/program files/NVIDIA GPU computing Toolkit their you will find CUDA installed version V9.0 or V10.0 depending on which version you have installed. Open the CUDA folder and you will find the bin, include and lib. Then carefully copy the contents of files bin, lib from cuDNN to CUDA (bin, lib and include).
5. Now set up the environment by opening the edit the system environment - Advance - within advance click on environment variables. A new window will pop up system variable - look for path - select and edit it. Now we have to add two paths.  
C:\Program Files\NVIDIA GPU Computing Toolkit\CUDA\v10.0\bin  
C:\Program Files \NVIDIA GPU Computing Toolkit\CUDA\v10.0\libnvvp
6. Install anaconda and create a python environment  
conda create -n tensorflow-gpu python=3.7  
activate tensorflow-gpu
7. Install tensorflow-gpu  
pip install --ignore-installed --upgrade tensorflow-gpu