SECTION C
Weekly Journal

Instruction to Student:

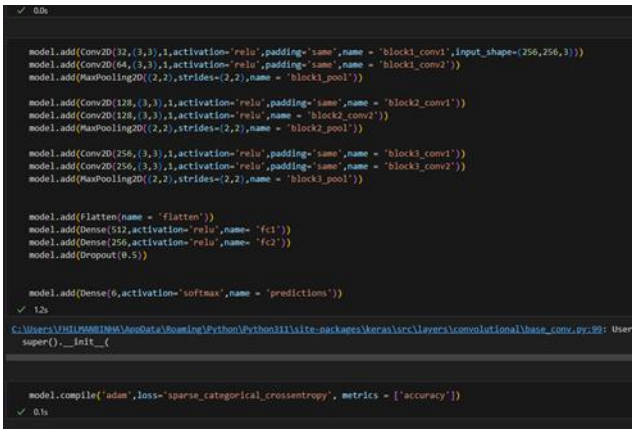
1. On a daily basis, record the specific task that you carried out for that day.
2. At the end of every week, describe one task in more details with diagrams or photos attached.

Week : Date from: 25/3/2024 to 28/3/2024

Department/Section Attached: Assembly Metrology

Day	Tasks Record
Monday	• Created a Multiclass CNN model using softmax activation instead of sigmoid. • Cleaned up data and divided into the separate multiclass folders. • Created a 19 Layer VGG CNN Model, Did not shrink images to include more details • Studied activation functions and other features of machine learning. • Achieved 0.6 accuracy and 0.9 loss.
Tuesday	• Previous model had too many layers causing overfitting. • Reduced layers to 10 layers with 126,499,782 trainable parameters, a little less than the previous model. • This new model achieved a much higher accuracy and lower loss despite lower complexity. • Conducted Daily User Validation of the UFADC, found many overkilling and some underkilling by the system. • Noticed a pattern in the defects and provided a summary to my supervisor.
Wednesday	• Coded python to augment images from files. • Created augmented data set from the original to create 10,000 image data set. • Added more defect images to the original training set. • Re-trained a previous model with the augmented data. • Created a newer model with more layers to find the optimal number of layers and dense. • Attended a particle control workshop to learn the importance of particle control and how simple actions can produce large amounts of particles + the importance of proper dressing and equipment. • The model spent 8-9 hours training with 2000+ images and 20 epochs. ○ Require reducing training time to ensure completion.
Thursday	• Created augmented data set from the original to create 20,000 image data set. • Added more defect images to the original training set. • Re-trained a previous model with the augmented data. • Created a newer model with more layers to find the optimal number of layers and dense.
Friday	

Describe one task in more details with diagrams or photos attached.
Explain the importance/relevance of this task to the company.



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✓ 0.0s

model.add(Conv2D(32,(3,3),1,activation='relu',padding='same',name = 'block1_conv1',input_shape=(256,256,3)))
model.add(Conv2D(64,(3,3),1,activation='relu',padding='same',name = 'block1_conv2'))
model.add(MaxPooling2D((2,2),strides=(2,2),name = 'block1_pool'))

model.add(Conv2D(128,(3,3),1,activation='relu',padding='same',name = 'block2_conv1'))
model.add(Conv2D(128,(3,3),1,activation='relu',name = 'block2_conv2'))
model.add(MaxPooling2D((2,2),strides=(2,2),name = 'block2_pool'))

model.add(Conv2D(256,(3,3),1,activation='relu',padding='same',name = 'block3_conv1'))
model.add(Conv2D(256,(3,3),1,activation='relu',padding='same',name = 'block3_conv2'))
model.add(MaxPooling2D((2,2),strides=(2,2),name = 'block3_pool'))


model.add(Flatten(name = 'flatten'))
model.add(Dense(512,activation='relu',name= 'fc1'))
model.add(Dense(256,activation='relu',name= 'fc2'))
model.add(Dropout(0.5))


model.add(Dense(6,activation='softmax',name = 'predictions'))
✓ 1.2s
C:\Users\FHILMANRINHA\AppData\Roaming\Python\Python311\site-packages\keras\src\layers\convolutional\base_conv.py:99: User
  super().__init__(


model.compile('adam',loss='sparse_categorical_crossentropy', metrics = ['accuracy'])
✓ 0.1s
```

This model that's I created has a total of 12 layers and over 120 million trainable parameters. Parameters are the training block of machine learning. These parameters are like the pages of a book, the more pages the more information it can store. With more parameters, the Model can differentiate the features and pick out information from the data at higher complexity. Hence, smaller details can be classified by the model. However, the more parameters in the model the larger the data set has to be to ensure high accuracy and low loss rate. Additionally having too many layers can lead to overfitting by the model.

So my task is to create the most complex model for the problem without sacrificing accuracy and loss which can result in overfitting. To make the model more advanced I introduce newer data, augmented data so the model can learn from a different colour, orientation and focus. This would train the model to make more accurate deductions and predictions.

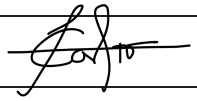
I will also be using different activations apart from the most used ReLu. Such as Softmax, PReLu and GeLu.activations are mathematical function applied to the output of each neuron. It determines the output a neuron should produce given an input or set of inputs. These activations help in the filtering and calculations at each layer. By utilizing the other activations, I am able to prevent dead neurons and calculations will be more accurate.

Assessment on Student

Grading Scheme :

A (Excellent)	-	Consistently exhibit qualities beyond expectation and norms.
B+ (Very Good)	-	Exhibit qualities above expectation and the norms.
B (Good)	-	Exhibit qualities which are considered necessary to produce good quality work.
C+ (Good Credit)	-	Exhibit good qualities which are the norm.
C (Credit)	-	Exhibit acceptable qualities which are the norm.
D (Pass)	-	Exhibit qualities which varies between the norm and unacceptable standard.
F (Fail)	-	Exhibit qualities which are not acceptable and are hindrances to operations.

Conduct:	A	Attendance: A	* Regular / ~~Average / Poor~~
Performance :	B+	Punctuality: A	* Satisfactory / ~~Unsatisfactory~~
Remarks :			

Name of Supervisor :	Francis Castro	Signature :	
*Delete whichever is not applicable		Date :	