Clearml Task learning report

What i did this task:

- installed and fixed my server
- used agent to fit my model using server
- loaded dataset to clearml server and updated it using parent
- set configuration hyperparameters
- trained a few models and checked comparing options
- learned how to use clearml features

How task was done:

1. loaded some training data to server

howerer i didnt use it, cause i would reloaded it few times one after one, but its pretty good instrument to control, edit and share data

2. the convolutional neural network I trained.

```
data = {"batch_size":64, "epochs":2, "first layer filter":5, "second layer filter":3, "MaxPooling":2}
task.connect(data)

input_img = Input(shape=(28, 28, 1))
x = Conv2D(32, (data["first layer filter"], data["first layer filter"]), activation='relu')(input_img)
x = MaxPooling2D((2, 2))(x)
x = Conv2D(64, (data["second layer filter"], data["second layer filter"]), activation='relu')(x)
x = MaxPooling2D((data["MaxPooling"], data["MaxPooling"]))(x)
x = Flatten()(x)
x = Dense(128, activation='relu')(x)
output = Dense(10, activation='softmax')(x)

model = Model(input_img, output)
model.compile(loss='categorical_crossentropy', optimizer='adam', metrics=['accuracy'])
```

Here, I have identified some of the parameters of the neural network so that we can easily modify them in our framework.

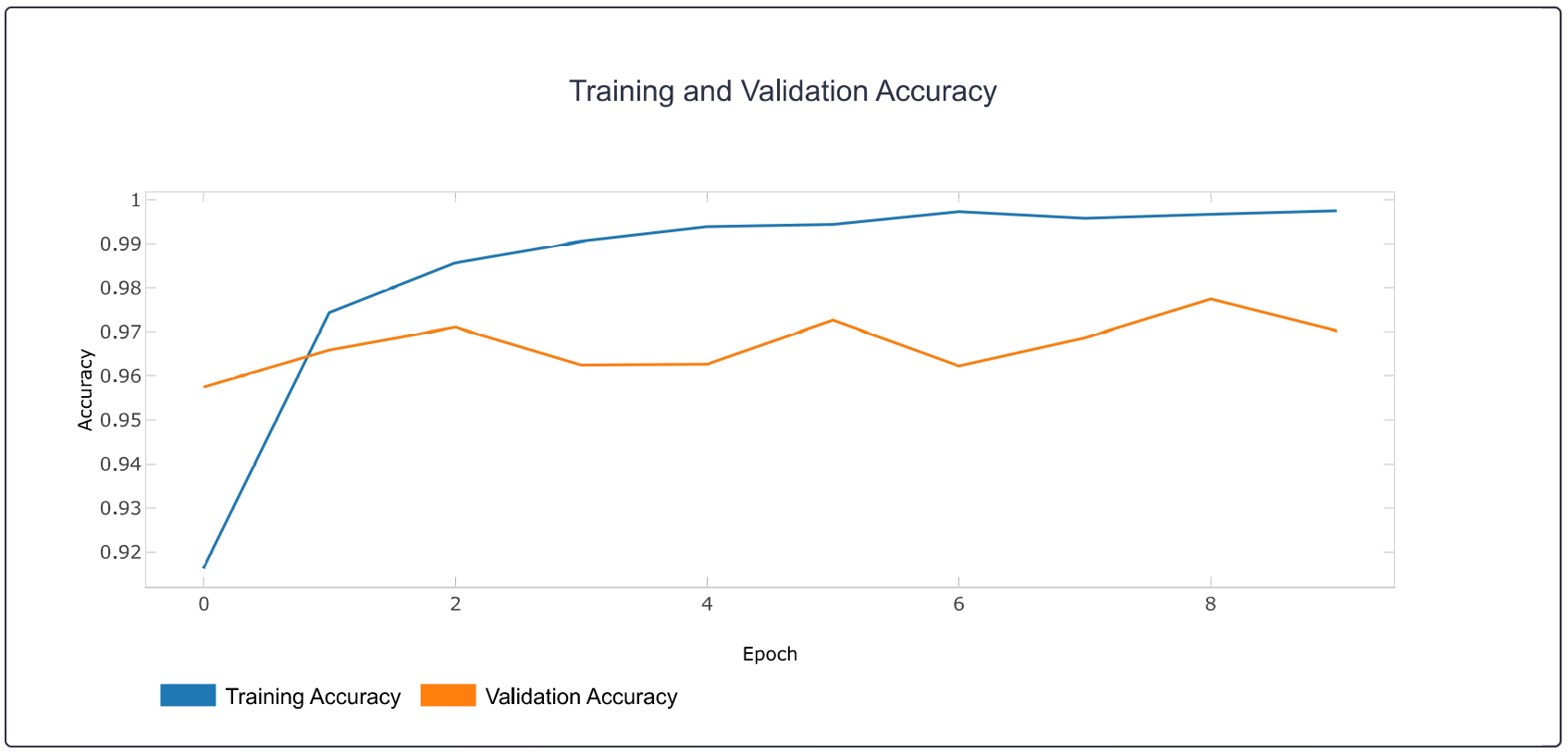
3. Training

In this framework, there is an extremely convenient system. I was able to clone the conducted experiment in just 10 minutes and queued up 3 models for training with different neural network parameters.

After that, I got distracted preparing food, and 2 hours later, I already had a report on each neural network along with the corresponding plots.

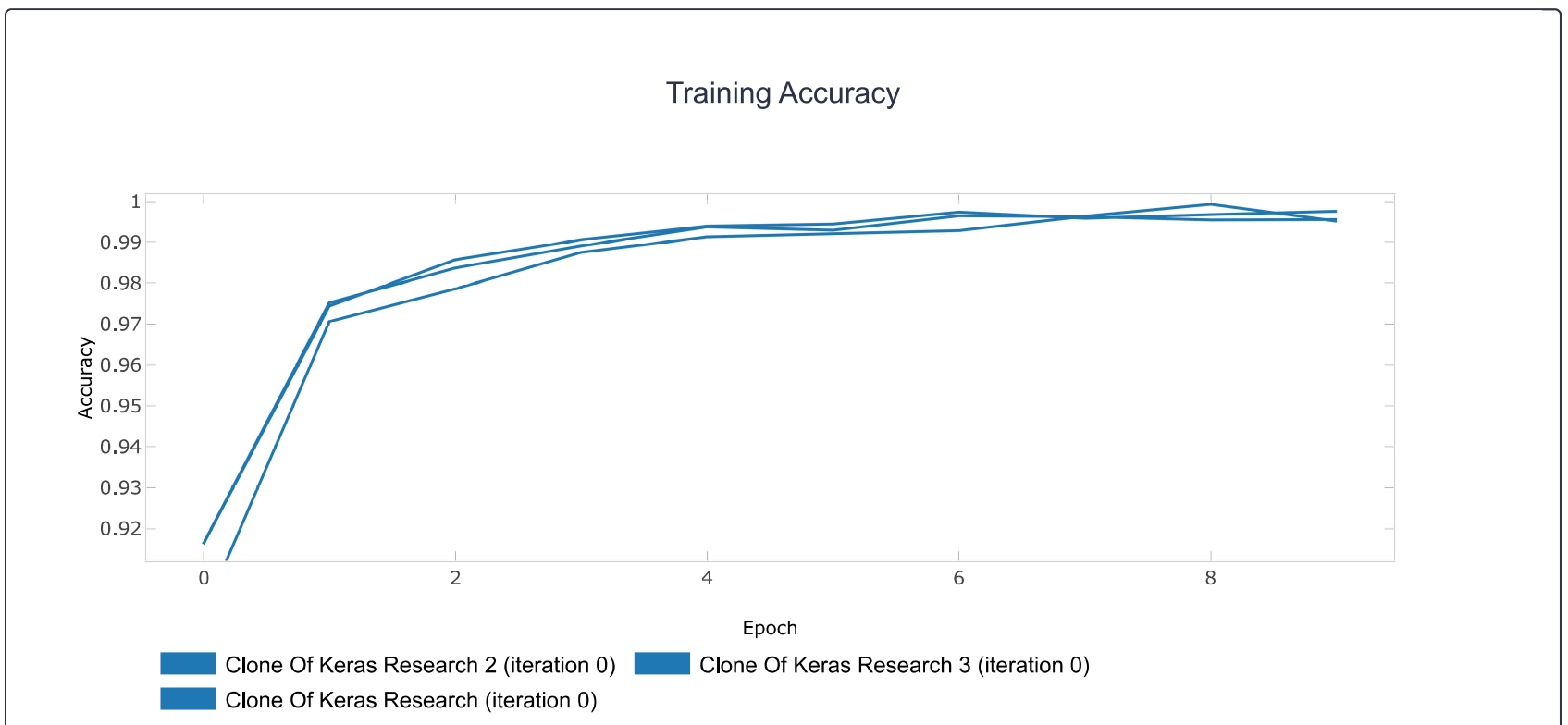
4. Comparing

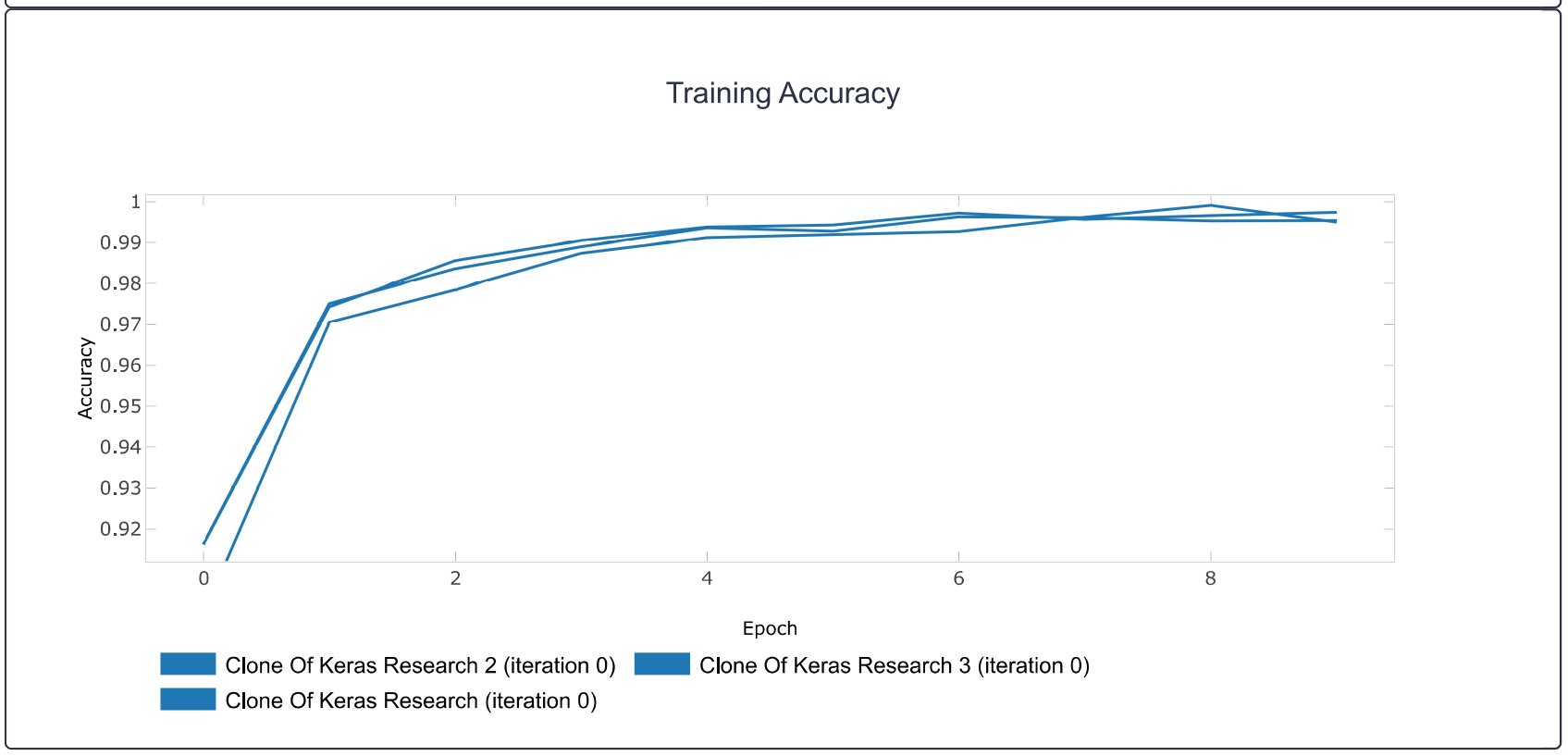
Similarly, the system has an intelligent comparison feature for graphs. In my code, I have both the training accuracy and test accuracy displayed on one graph. However, when compared with other experiments, this graph automatically splits into two, enabling convenient comparison between the corresponding graphs for the models



Comparing different models

~~somehow i cant change colors here~~





5. Conclusion

It looks like Model 3 is lagging behind the others in all aspects. Seems like the 2x2 filters are handling the task worse compared to the larger dimension filters. We should go for larger filters to capture bigger image features.

	model 1	**model 2**	**model 3**
first layer filter	5	3	2
second layer filter	3	5	2

Second model has a little better accuracy, so we can think using smaller filters at start is better idea else doing otherwise

ClearML is a very convenient and multifunctional tool that allows simplifying the analysis of research results as well as performing various operations.