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Learning Experience and Key Takeaways

The practical experience allowed anyone without coding experience to start learning deep learning basics. My activities with the VGG16 model provided insights about deep learning operational principles alongside understanding image processing techniques and prediction methodologies. The most remarkable observation concerned the model's ability to make accurate predictions about images but how slight input adjustments could influence those predictions.

Data preprocessing emerged as a vital lesson during our learning experience. Image inputs require resizing and normalization as fundamental prerequisites before model input. The data preprocessing step guarantees both correct models understanding of data along with optimal performance.

Challenges Faced

The evaluation of slight changes in the input picture images presented an initial learning obstacle. Different transformation techniques which included image rotation or addition of noise data introduced errors which led the model to make incorrect classifications and reduce its prediction certainty. This study reveals deep learning systems expose themselves to substantial performance changes from input variations thus requiring both trustworthy training data and robust augmentation methodologies.

Complexities in VGG16 architectural design created interpretation problems for me. This model framework consists of multiple stacked convolutional layers accompanied by pooling layers combined with fully connected layers. The model summary contained enough details though I realized I needed more education about each individual layer's workings.

Critical Analysis of Results

Standard images produced substantial accuracy from the model however the system became less reliable when confronted with variations in images. Real-world deep learning

models currently face challenges detecting alterations in camera angles and illumination levels together with modest object degradations. The model demonstrated successful pattern recognition through its frequent matching of closely related objects which appeared in the top three predictions.

Future Applications

The analytical activities confirmed my insights about pre-trained models in their practical functions. The integration of these models delivers practical performance for image recognition activities together with medical diagnosis systems and autonomous operation systems. The need to use diverse datasets alongside techniques that augment data has become clear to me since my approach to model robustness.

Final Thoughts

The laboratory experience proved both interesting and educational because it provided classroom interaction on deep learning fundamentals. I better understood how pre-trained models apply their learning capabilities across different images through the structured system. Moving into the future I wish to investigate methods of suitable model individualization for targeted applications and work on more nuanced knowledge of such systems constraints.