

## Rubric: Final Project: Animal Classification

Criterion				
	Poor 0 pts	Fair 1 pts	Good 2 pts	Excellent 3 pts
<b>Data Analysis</b> <b>9 pts</b> 0-3-6-9	<b>Poor</b> - None	<b>Fair</b> - Data was only loaded into training, validation and test sets. - No samples are plotted.	<b>Good</b> - Data was only loaded into training, validation and test sets and samples plotted. - No commentary.	<b>Excellent</b> - Data was only loaded into training, validation and test sets and samples plotted. - With insightful commentary.
<b>Data Augmentation</b> <b>12 pts</b> 0-4-8-12	<b>Poor</b> - None	<b>Fair</b> - Data was augmented with one technique (flipped, rotated, shifted, zoomed, photometric distortions, etc). - Little to no commentary.	<b>Good</b> - Data was augmented with one technique (flipped, rotated, shifted, zoomed, photometric distortions, etc). - Identified that data augmentation is required with commentary supplied as to why. (Training set size is too small, helps combat overfitting, improves model robustness, etc)	<b>Excellent</b> - Data was augmented using more than one technique (flipped, rotated, shifted, zoomed, photometric distortions, etc). - Identified that data augmentation is required with commentary supplied as to why. (Training set size is too small, helps combat overfitting, improves model robustness, etc)
<b>Data Preparation</b> <b>18 pts</b> 0-6-12-18	<b>Poor</b> - None	<b>Fair</b> - Data reshaped using centering, normalization or standardization. - no commentary.	<b>Good</b> - Data reshaped using centering, normalization or standardization. - Only one of the data preprocessing techniques were acknowledged. - Motivations as to why. (model input range limitations, memory issues, compensate for RGB values, etc)	<b>Excellent</b> - Data reshaped using centering, normalization or standardization. - More than one type of data preprocessing technique was considered. - Motivation for the choice of technique.

<b>Model Choice</b> <b>15 pts</b> 0-5-10-15	<b>Poor</b> <ul style="list-style-type: none"> <li>- Only one model considered.</li> <li>- No motivation.</li> </ul>	<b>Fair</b> <ul style="list-style-type: none"> <li>- Only one model considered.</li> <li>- Motivation for choice of model.</li> </ul>	<b>Good</b> <ul style="list-style-type: none"> <li>- Only one model chosen but multiple were considered.</li> <li>- Motivation for choice of final model</li> </ul>	<b>Excellent</b> <ul style="list-style-type: none"> <li>- More than one type of model (or different configurations of the same type i.e. different structured NNs) chosen.</li> <li>- Motivations as to why.</li> </ul>
<b>Model Training</b> <b>21 pts</b> 0-7-14-21	<b>Poor</b> <ul style="list-style-type: none"> <li>- Model(s) only trained.</li> <li>- No commentary on training results.</li> <li>- No commentary for choice of loss metrics, no graphs, etc.</li> </ul>	<b>Fair</b> <ul style="list-style-type: none"> <li>- Model(s) trained</li> <li>- Commentary on training results. (loss criteria, overfitting, how well the model fairs, etc)</li> <li>- No commentary for choice of loss metrics, learning rates, selection of optimizers, etc</li> </ul>	<b>Good</b> <ul style="list-style-type: none"> <li>- Model(s) trained</li> <li>- Commentary on training results. (loss criteria, overfitting, how well the model fairs, etc)</li> <li>- Commentary for choice of loss metrics, learning rates, selection of optimizers, etc</li> <li>- No graphs or visualization of training.</li> </ul>	<b>Excellent</b> <ul style="list-style-type: none"> <li>- Model(s) trained</li> <li>- Commentary on training results. (loss criteria, overfitting, how well the model fairs, etc)</li> <li>- Commentary for choice of loss metrics, selection of optimizers, etc</li> <li>- Training visualized through graphs. (confusion matrix, roc curve, accuracy estimates vs epoch, etc)</li> </ul>
<b>Model Tuning</b> <b>18 pts</b> 0-6-12-18	<b>Poor</b> <ul style="list-style-type: none"> <li>- No parameters are tuned for.</li> <li>- No discussion regarding hyper-parameters.</li> </ul>	<b>Fair</b> <ul style="list-style-type: none"> <li>- Hyper-parameters were tuned and evaluated.</li> <li>- No discussion regarding hyper-parameters.</li> </ul>	<b>Good</b> <ul style="list-style-type: none"> <li>- Hyper-parameters were tuned and evaluated on the validation set.</li> <li>- Commentary on the different hyper-parameters.</li> </ul>	<b>Excellent</b> <ul style="list-style-type: none"> <li>- Hyper-parameters were tuned and evaluated on the validation set.</li> <li>- Commentary on the different hyper-parameters.</li> <li>- Performance of different values of hyper-parameters visualized through graphs.</li> <li>- Choice of tuning technique justified (grid search, etc).</li> </ul>

<b>Model assessment</b> <b>21 pts</b> 0-7-14-21	<b>Poor</b> - No test results shown.	<b>Fair</b> - Results shown through tabular data and/or graphs. (confusion matrix, ROC curve, etc) - No discussion	<b>Good</b> - Results portrayed through tabular data and/or graphs. (confusion matrix, ROC curve, etc) - Commentary regarding the choice of performance metric.	<b>Excellent</b> - Results portrayed through tabular data and/or graphs. (confusion matrix, ROC curve, etc) - Commentary regarding performance of the model. (Different models compared) - Commentary regarding the choice of performance metric. (Accuracy, cross entropy loss, etc) - Discussion on how performance could be increased further.
<b>Final Model Performance</b> <b>18 pts</b> 0-6-12-18	<b>Poor</b> 0-50 % Accuracy	<b>Fair</b> 50-70 % Accuracy	<b>Good</b> 70-90 % Accuracy	<b>Excellent</b> 90-100 % Accuracy
<b>Presentation</b> <b>15 pts</b> 0-5-10-15	<b>Poor</b> - No commentary. - Graphs are incomplete (axes are not named, no titles).	<b>Fair</b> - Little commentary throughout. - Graphs are incomplete (axes are not named, no titles).	<b>Good</b> - Commentary is sufficient. - Graphs are incomplete (axes are not named, no titles).	<b>Excellent</b> - Commentary is sufficient as well as insightful. - Graphs are well presented (axes are labelled, graphs are titled). - Notebook flows neatly.

Comments:

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