

Model Development Phase

Date	17 June 2025
Team ID	SWTID1749876754
Project Title	SynapseScan: AI Driven Classification of Ovarian Cancer Variants
Maximum Marks	4 Marks

Initial Model Training Code, Model Validation and Evaluation Report

The initial model training code will be showcased in the future through a screenshot. The model validation and evaluation report will include classification reports, accuracy, and confusion matrices for multiple models, presented through respective screenshots.

Initial Model Training Code:

```
182 input_shape = (224, 224, 3)
183
184 if os.path.exists(model_path):
185     print("Loading existing model...")
186     cnn_model = load_model(model_path, custom_objects=custom_objects)
187 else:
188     print("Creating and training new model...")
189     cnn_model = create_inception_model(input_shape)
190     cnn_model.compile(optimizer=Adam(learning_rate=0.0001),
191                       loss='sparse_categorical_crossentropy',
192                       metrics=['accuracy'])
193     history = cnn_model.fit(
194         train_gen_new,
195         validation_data=valid_gen_new,
196         epochs=20,
197         callbacks=[early_stopping],
198         verbose=1
199     )
200     cnn_model.save(model_path)
201     print(f"Model saved to {model_path}")
202
```

Model Validation and Evaluation Report:

Model	Classification Report	F1 Score	Confusion Matrix																																																																																	
InceptionV3 + Attention + Fine-tuning	<div>Classification Report:</div> <table><thead><tr><th></th><th>precision</th><th>recall</th><th>f1-score</th><th>support</th></tr></thead><tbody><tr><td>0</td><td>0.9878</td><td>1.0000</td><td>0.9939</td><td>81</td></tr><tr><td>1</td><td>0.8675</td><td>0.8889</td><td>0.8780</td><td>81</td></tr><tr><td>2</td><td>0.8902</td><td>0.9012</td><td>0.8957</td><td>81</td></tr><tr><td>3</td><td>0.9753</td><td>0.9634</td><td>0.9693</td><td>82</td></tr><tr><td>4</td><td>0.9744</td><td>0.9383</td><td>0.9560</td><td>81</td></tr><tr><td>accuracy</td><td></td><td></td><td>0.9384</td><td>406</td></tr><tr><td>macro avg</td><td>0.9390</td><td>0.9384</td><td>0.9386</td><td>406</td></tr><tr><td>weighted avg</td><td>0.9391</td><td>0.9384</td><td>0.9387</td><td>406</td></tr></tbody></table>		precision	recall	f1-score	support	0	0.9878	1.0000	0.9939	81	1	0.8675	0.8889	0.8780	81	2	0.8902	0.9012	0.8957	81	3	0.9753	0.9634	0.9693	82	4	0.9744	0.9383	0.9560	81	accuracy			0.9384	406	macro avg	0.9390	0.9384	0.9386	406	weighted avg	0.9391	0.9384	0.9387	406	93.84%	<div>Confusion Matrix</div> <table><thead><tr><th></th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th></tr></thead><tbody><tr><th>0</th><td>81</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><th>1</th><td>0</td><td>72</td><td>7</td><td>0</td><td>2</td></tr><tr><th>2</th><td>1</td><td>5</td><td>73</td><td>2</td><td>0</td></tr><tr><th>3</th><td>0</td><td>2</td><td>1</td><td>79</td><td>0</td></tr><tr><th>4</th><td>0</td><td>4</td><td>1</td><td>0</td><td>76</td></tr></tbody></table>		0	1	2	3	4	0	81	0	0	0	0	1	0	72	7	0	2	2	1	5	73	2	0	3	0	2	1	79	0	4	0	4	1	0	76
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