EAST WEST UNIVERSITY

CSE366: Artificial Intelligence

“Task 5 Report”

Submitted to:

Dr. Raihan Ul Islam(DRUI)

Submitted by:

Group 05

Benazir Meem	2022-3-60-169
Riya Akter	2022-3-60-176
Asifa Akter Liya	2022-3-60-186
Ishrat Jahan Anika	2022-3-60-195

Task 5: Explainability and Generalizability Testing

Dataset 1: TeaLeaf Dataset

The Custom CNN achieved strong classification performance on the TeaLeaf dataset. The detailed classification report is summarized below:

- **Overall Accuracy:** 97%
- **Macro F1-score:** 0.97

Class	Precision	Recall	F1-score	Class Accuracy
0	0.95	1.00	0.98	1.000
1	1.00	0.94	0.97	0.943

Dataset 2: Tea_Leaf_Disease Dataset

To assess generalizability, the same Custom CNN architecture was applied to the Tea_Leaf_Disease dataset containing multiple disease classes. The model achieved excellent performance across all classes:

- **Overall Accuracy:** 98%
- **Macro F1-score:** 0.98

Class	Precision	Recall	F1-score	Class Accuracy
0	0.99	0.99	0.99	0.993
1	0.98	0.96	0.97	0.962
2	0.96	0.99	0.97	0.987
3	0.96	1.00	0.98	1.000
4	1.00	0.97	0.99	0.973
5	1.00	0.97	0.98	0.967

Generalizability Testing

To assess the generalizability of the proposed model, a second tea leaf dataset from the same domain was used. The best-performing Custom CNN trained on the TeaLeaf dataset was retrained using the same architecture and hyperparameters on the new dataset.

The results show a small performance variation compared to the original dataset, mainly due to differences in image quality, lighting conditions, background complexity, and leaf orientation. Despite these variations, the model maintains strong performance, demonstrating its robustness and ability to generalize well across similar datasets.