**INXOL TECHNOLOGIES**

**GENDER CLASSIFICATION USING MACHINE LEARNING APPROACH (Task 1)**

**ABSTRACT**

The classification of gender based on facial images has gained significant attention due to its potential applications in various fields such as security, marketing, and entertainment. In this report, we explore the performance of different machine learning algorithms for the task of gender classification using facial images. The algorithms considered are k-Nearest Neighbors (k-NN), Support Vector Machine (SVM), Random Forest, Logistic Regression, and Decision Tree. We also discuss the preprocessing steps involved in preparing the data for training and testing, including resizing, normalization, label encoding, and random permutation.

**Algorithm Performance:**

The accuracy results for the gender classification task using different machine learning algorithms are as follows:

* Support Vector Machine (SVM): 84%
* Random Forest: 81%
* Logistic Regression:81 %
* K-Nearest Neighbors (k-NN): 77%
* Decision Tree: 69%

**Model Evaluation:**

When we use new pictures in the models, Random Forest and Decision tree give wrong prediction while deploying this is due to these models underfit. While other models give accurate prediction.

**Conclusion:**

In conclusion the SVM was the best at making predictions with a accuracy of 84%. The random forest and Logistic Regression models did well too, with accuracies of 81% for both. KNN was decent with 74% accuracy, but the Decision Tree model didn't perform as well, only achieving 69%. This information helps us choose the right model for different jobs where we need predictions. also the machine learning approach is very time taking. Logistic regression, Random Forest and Decision tree give wrong prediction while deploying this is due to these models underfit.