IDEATIONPHASE:BRAINSTORM&IDEA PRIORITIZATION

TeamID:LTVIP2026TMIDS24615
TeamLeader:KAGITA SAI PRASANTH
TeamMembers:SAI PAVAN,VALLURI VINAY,DINESH
ProjectName:AI-PoweredDogBreedIdentificationusingTransfer Learning

STEP-1:TEAMGATHERINGANDPROBLEMSELECTION

Brainstorming provides an open environment for creative thinking to lead to effective problem-solving.Forthisproject,theteamfocusedonidentifying120differentdogbreedswithhigh accuracy.

- **Identified Problem Area:** Manual dog breed identification is time-consuming, requires expert knowledge,andispronetohumanerrorduetofine-grainedvisualsimilaritiesbetweenbreeds.
- **Finalized Problem Statement:** Current manual methods are inefficient for large-scale classification.ThereisaneedforanautomatedAIsystemcapableofidentifying120breeds from single images (JPG/PNG) using deep learning techniques.

STEP-2:BRAINSTORMING,IDEALISTINGAND GROUPING

Duringthisphase,weprioritizedvolumeovervaluetogeneratediverseideasfortheclassification system.

GeneratedIdeas	**IdeaGrouping**
• ManualFeatureExtraction (SIFT/ORB)	• **TraditionalComputerVision:**Usinghand-crafted features and classical algorithms.
• SupportVectorMachines (SVM)	• **MachineLearning:**ClassificationusingtraditionalML algorithms.
• BuildingaCustomCNNfrom scratch	• **DeepLearning:**End-to-endCNN-basedclassification.
• **MobileNetV2Transfer Learning**	• **TransferLearning:**Leveragingpre-trainedCNN architectures.

STEP-3:IDEAPRIORITIZATION

Todeterminethebestpathforward,theteamevaluatedtheideasbasedonspecificcriteriato ensure the solution was both important and feasible.

Evaluation Criteria:

- **AccuracyPotential:** Ability to reach >60% validation accuracy.
- **Computational Efficiency:** Fast inference speed (<100ms) on standard hardware.
- **Implementation Complexity:** Ease of building a production-ready system.
- **Scalability:** Capability to handle 120 distinct classes.

Selected Approach (Chosen Solution):

Theteamselected**TransferLearningusing MobileNetV2**.

- **Why:** It provides higher classification accuracy, faster convergence (training in ~30-60 minutes),andefficientfeatureextractionwhilereducingoveralltrainingcomplexitycompared to building a model from scratch.
- **Outcome:**Achievedavalidationaccuracyof**67.26%**withalightweightmodelsizesuitablefor web deployment.