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Project Name: Dog Breed Identification Using Transfer Learning

Empathize and Discover

1. Empathize

In this stage, we focused on understanding the needs, problems, and expectations of users related to dog breed identification.

Many people such as pet owners, veterinarians, animal shelter workers, and dog lovers face difficulty in correctly identifying dog breeds. Some common challenges are:

• Confusion between similar-looking breeds
• Lack of expert knowledge
• Difficulty identifying mixed breeds
• Time-consuming manual research

Users need a simple, fast, and accurate solution that can identify dog breeds using just an image. They prefer a system that is:

• Easy to use
• Accessible through mobile or web
• Accurate and reliable
• Fast in giving results

Understanding these needs helped us decide to build an AI-based system using transfer learning for accurate dog breed classification.

2. Discover

In the discovery phase, we analyzed the problem and explored possible technical solutions.

Key discoveries include:

• Image classification using deep learning is effective for breed identification.
• Pre-trained models like Google's MobileNet and Microsoft's ResNet reduce training time and improve accuracy.
• Transfer learning helps in achieving high performance even with limited dataset.
• Public datasets such as the Stanford Dogs dataset can be used for training.

We identified that:

• Convolutional Neural Networks (CNNs) are suitable for image classification.
• Data preprocessing and augmentation improve model accuracy.
• A user-friendly interface is important for better user experience.

Based on these findings, we finalized our approach of using transfer learning with a pre-trained CNN model to develop an efficient dog breed identification system.