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Applications of Artificial Intelligence**

**Module 6 Evaluation of Google Cloud Vision API for Image Classification Tasks**

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**Introduction:**

This report examines the feasibility of using an existing Machine Learning (ML) service, specifically the Google Cloud Vision API, for image classification tasks. The CIFAR-10 dataset, a collection of low-resolution images, was chosen to test the service's capabilities. This analysis aims to determine the adequacy of Google Cloud Vision API for specific use cases and suggest appropriate next steps where its performance may be lacking.

**Choice of ML Service:**

The Google Cloud Vision API was selected for this project due to its accessibility and ease of integration. As a widely recognized and easy-to-use computer vision service, it offers a broad range of functionalities, including image labeling, which is critical for this assignment.

**Performance Analysis:**

Upon testing the API with the CIFAR-10 dataset, it was observed that the performance was suboptimal for high-accuracy requirements. Out of ten images tested, only three were successfully classified by the service. A potential reason for this could be the low resolution of CIFAR-10 images, which may not align well with the capabilities of the API, designed for higher-resolution, real-world images.

**Suitability for Requirements:**

Considering the project's objectives, the Google Cloud Vision API's performance was not entirely sufficient. However, its effectiveness can vary based on specific use cases. For instance, in scenarios like matching images in a PowerPoint presentation to suggested themes, the API's performance could be considered adequate, demonstrating its conditional suitability.

**Recommendations for Improvement:**

Developing a new custom computer vision model was deemed cost-prohibitive and resource-intensive. Instead, a more viable approach would be to utilize a model that can extract potential tags or labels from the Google Cloud Vision API and convert them into key actionable insights or keywords. This approach could leverage the strengths of the API while compensating for its limitations in certain scenarios.

**Conclusion:**

In conclusion, the Google Cloud Vision API offers a convenient and accessible solution for computer vision tasks but with limitations in handling specific datasets like CIFAR-10. While it may not meet the high-accuracy demands of certain applications, it remains a valuable tool for scenarios requiring general image recognition and theme matching. For more specialized tasks, a hybrid approach, utilizing the API's outputs as a foundation for further analysis, is recommended.

**References**

Google. (n.d.). *Detect handwriting in images  |  cloud vision API  |  google cloud*. Google. https://cloud.google.com/vision/docs/handwriting#vision-document-text-detection-python