# Implications

* The implementation of a deep learning‐based car detection system shows how computer vision can transform automotive surveillance and traffic monitoring.
* Automating vehicle classification supports real-time decision-making in traffic management.
* Performance insights will help build a more robust model for implementation in autonomous vehicles.
* The Stanford project demonstrates that deep learning-based car detection enables real-time vehicle localization.
* Using YOLO improves bounding box accuracy compared to a pure classification model like GoogLeNet.

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# Limitations

* *Image Quality:* The model’s performance can be impacted by variations in lighting, occlusions, and weather conditions, which are common in practical environments.
* *Data Augmentation:* The model required more images for getting trained to get accurate results. Creating synthetic data was not helping the model to predict accurately,
* *Class Imbalance:* the data set contained Clas Imbalance which let to reduced accuracy and prediction by the model.
* *Computational Complexity:* Fine-tuning deep architectures like YOLO and ResNet50 is resource intensive, limiting rapid experimentation and real-time deployment on resource-constrained devices.
* *Generalization:* The current approach may struggle with new car models or unconventional viewpoints, highlighting the need for a more diverse dataset and adaptive algorithms.

# Closing Reflections

* Working on this project led us to a deeper understanding of the object detection and classification techniques.
* The demands computing power required by these projects are too great in nature, makes us wonder on the scale of the infrastructure that would be required in real time.
* The model building process itself is iterative and in a time bound project this becomes very challenging.
* The project also helped us understand various models that are present.
* It has also provided us technical insights and practical lessons and made us go through various journals and documents for better understanding of the model
* From a team perspective it taught us how to collaborate and use the various collaborative tools to works as a team and overcome our differences.