Pavement

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Project Title:
Pavement Management System

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Potential for Advanced Image Evaluation in APCS

Evaluate the Potential for Advanced Image Evaluation in Automated Pavement Condition Surveys (APCS)

WHAT IS THE NEED?

Caltrans manages its pavements with a new and modern pavement management system, PaveM. One key component of the system is the automatic pavement condition survey (APCS) which collects millions of rights-of- way (ROW) and downwards images of the pavement. This data can be used to improve the pavement survey and other aspects of maintaining a roadway (e.g. drainage, etc.).

WHAT ARE WE DOING?

There have been many current advances in machine learning-based image analysis. This task will investigate using image analysis to discover features of the pavement from these images that would be useful for performance prediction. Examples include drainage evaluation and flagging replaced slabs. This will involve the development of extensive "training" datasets where these features have been manually flagged.

WHAT IS OUR GOAL?

The goal is to use advanced machine learning-based image analysis to improve the pavement survey. The improved analysis will improve PaveM predictions and help the Districts better manage their roadways.

WHAT IS THE BENEFIT?

The improved APCS data will allow PaveM to make better pavement predictions and, thus, Caltrans can be more proactive in maintaining its pavements. This will lead to reduce maintenance costs and create savings by maintaining longer-lasting pavements.

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Research Notes
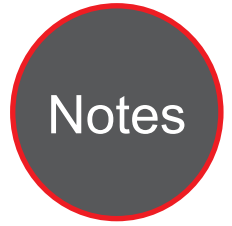
WHAT IS THE PROGRESS TO DATE?

1. Established a knowledge and computing environment suitable for training deep learning neural network models.
2. A library of tagged images, using various right-of-way and pavement surface images from different vendors, has been developed.
3. The framework for a model that flags recently replaced slabs on JPC pavements has been developed.
4. The framework for a model for categorizing the drainage conditions on the outside lane at various locations has been developed.
5. Preparing a report with recommendations for pilot implementation.