

Josh Peng

MOTORCYCLE LEAN ASSIST

Why Lean Assist?

- 25% of all motorcycle accidents are single-vehicle accidents
- Turning is done by leaning
Leaning is hard

Lessons from Mulholland Drive (a.k.a. *The Snake*)



Notorious for destroying motorcycles

Problem 1. Not enough lean



Problem 1. Not enough lean



Problem 2. Too much lean



Problem 2. Too much lean



Product Goals for MOTORCYCLE LEAN ASSIST

- For novice to intermediate riders
- Conveys lean angles from -45° to 45°

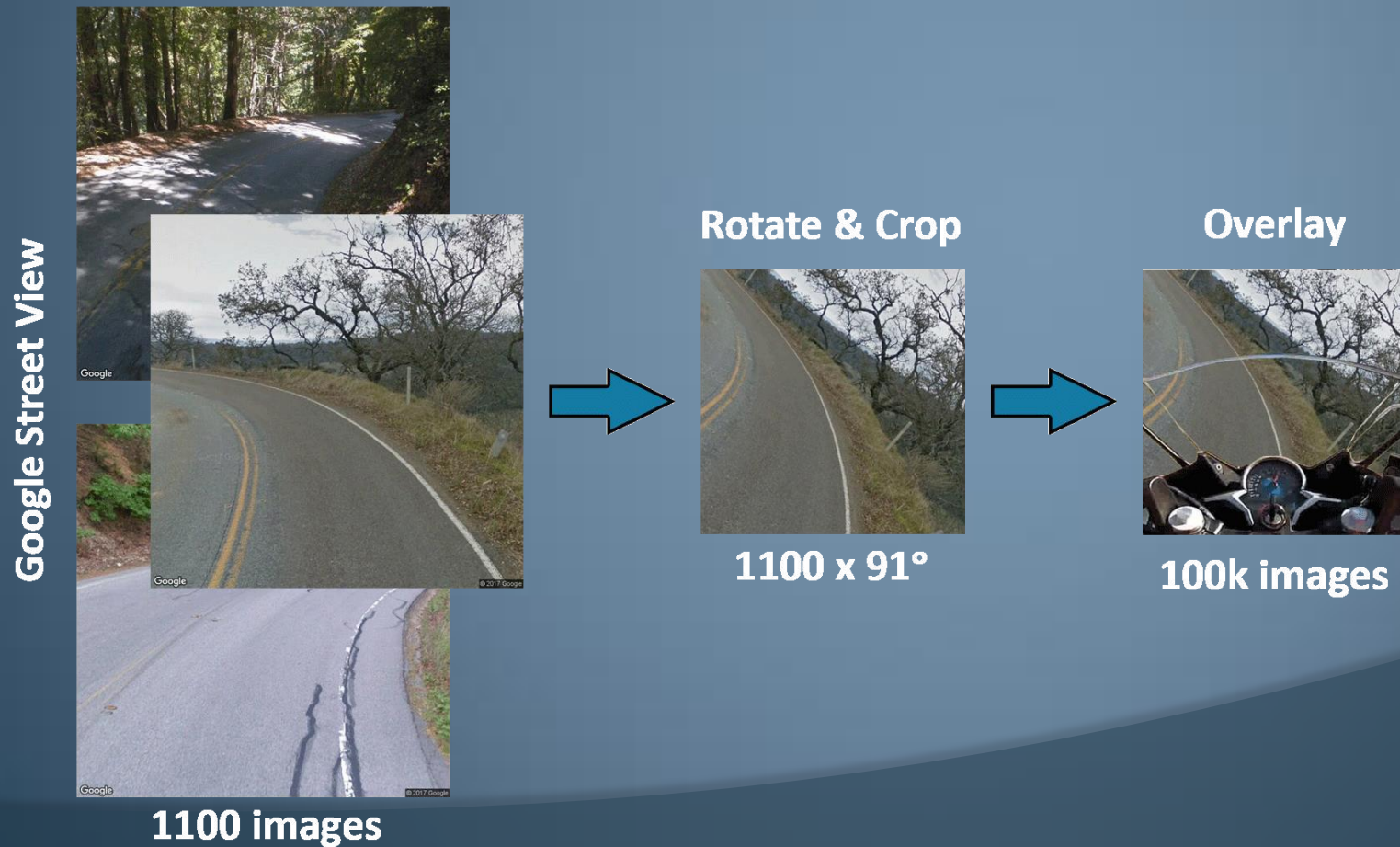


Data Science Solution

- ⦿ Supervised learning with image classification
 - Determine lean angles from photos of roads
- ⦿ Transfer learning from a deep neural network

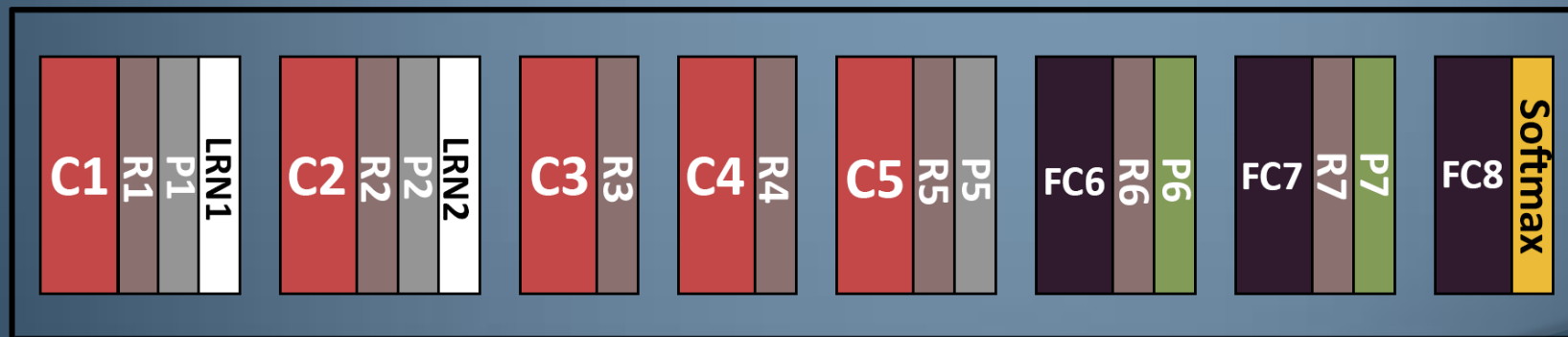
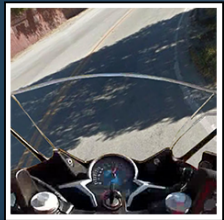
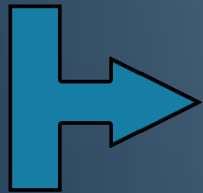
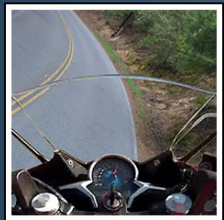
Synthetic Labeled Data Generation

Automation script for Adobe Photoshop



Supervised Learning of CNN

- 5 convolutional layers
- 3 fully-connected layers

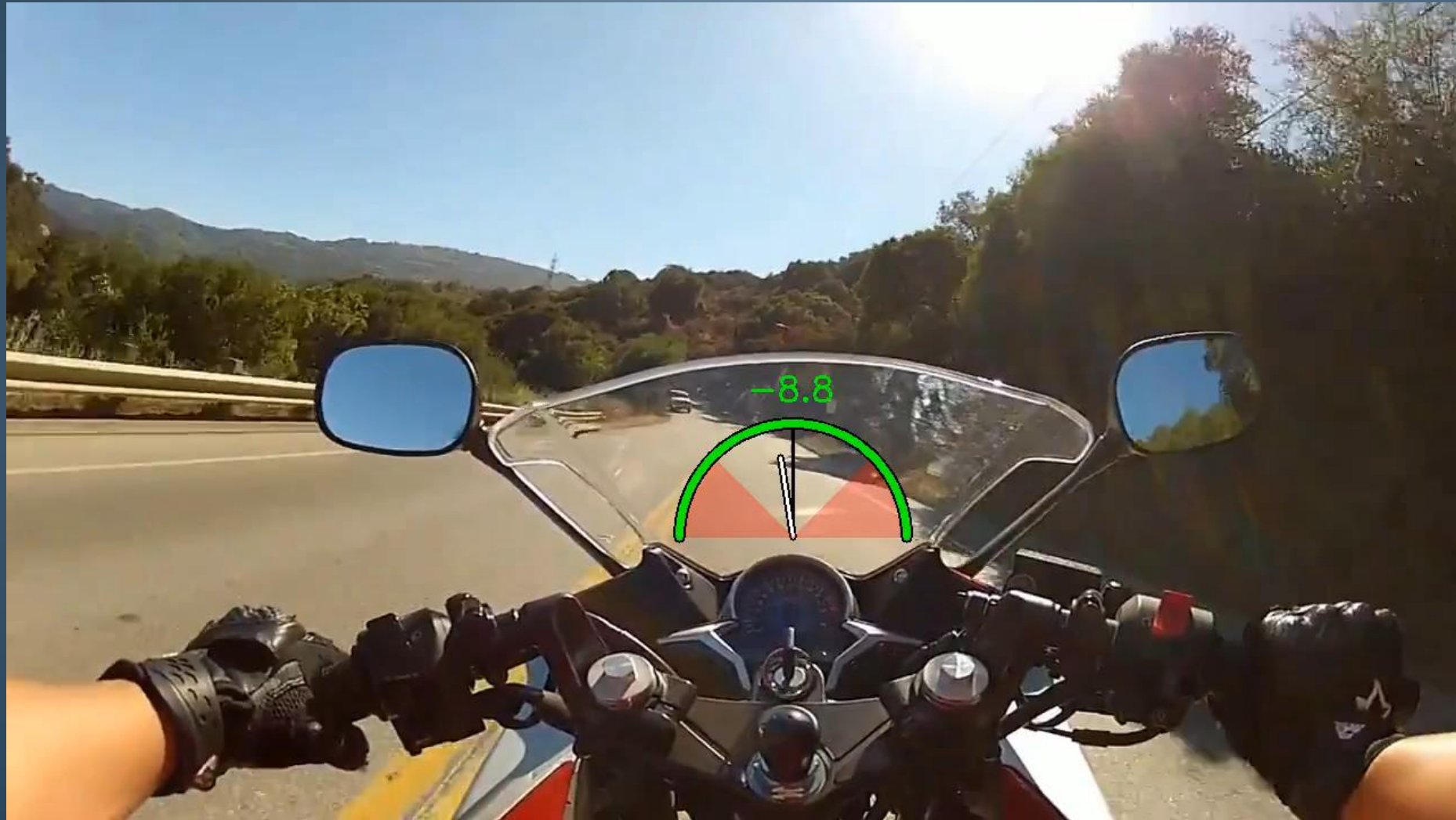


CNN (Modified AlexNet)



Lean
Angle

MOTORCYCLE LEAN ASSIST



Potential Human Interfaces

- ⦿ Heads-Up Display (HUD) projection
- ⦿ In-helmet audio cues
- ⦿ Post-ride video augmentation



Caffe



Thanks!



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