REALY Using
Machine Vision
Recipe: MACHINE VISION SYSTEM

SERVES: ONE RAILROAD

Start with MULTIPLE LINE SCAN CAMERAS. Sprinkle in a few AREA SCAN CAMERAS. Add in sufficient ILLUMINATION with a touch of AXLE TIMING.

On a LARGE SERVER, prep all necessary MACHINE LEARNING ALGORITHMS. Serve with a side of AEI and keep C&S and Technology nearby.
Should We Target Operational Issues?

- No Hump conditions
- EOTs laying on running boards
- Hazmat Placards intact
- Load Securement – OTL, tarps, loose straps
- Direction of loaded Automobiles
- Product Leakage
- Trespassers?
- Doors secured?
- Bad Order Tags
Should We Target Carbody Issues?

- End Air Hose Arrangements
- Car Number Stencil vs. AEI
- Air Hose Heights
- Built Date stencil vs. Umler
- Sill Steps/Ladder Rungs present
- Spring Nest Height
- Hatches closed?
- Hopper doors closed?
- Type of Box Car Door
- Type of Tank Car Valve
- Type of Brake System?
Should We Target Warranty Issues?

• Inspection of EOC carrier plate fasteners?
General Images: Covered Hopper Hatch Views
What Defects Can You Really See?

Cut Lever
Hanging Out
What Defects Can You Really See?

Cushion Unit Leaking

Cushion Unit Good
What Defects Can You Really See?

Built Up Tread Evident
Optimized for a *Single* Component
Specific Images Optimized for a *Single* Component
Processing Images is Not Without Hiccups

- Algorithms are not perfect!
- Images are not perfect!
- Car construction isn’t standard!
Other Challenges: MOW Gangs

Crushed by Hi-railer

Gouged
Full Train Imaging: Proof of Concept