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Autonomous Vehicle Safety

CCC

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**EDGE CASE
RESEARCH**

Brute Force AV Validation: Public Road Testing

- Good for identifying “easy” cases – but 1 billion++ miles(!)
 - Expensive and potentially **dangerous**

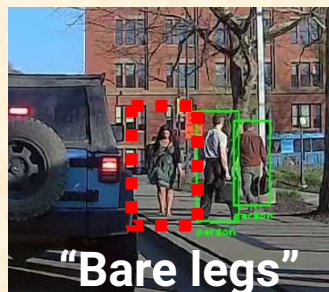
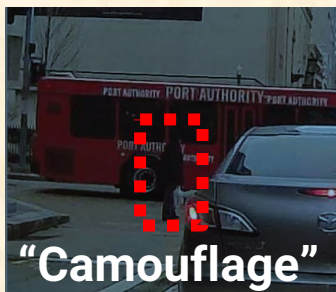


“Edge Cases” Are the Hard Part

- Novel objects (missing from zoo) are “triggering events”



■ Mask-R CNN: examples of systemic problems



**Notes: These are baseline, un-augmented images.
(Your mileage may vary on your own trained neural network.)**

- **Goal: structured way to argue that AV sufficiently safe**
 - Emphasize safety case, not engineering process
 - Checks and balances (self-audit and independent)
- **Monitoring and feedback**
 - Detect invalid assumptions & gaps in coverage
- **System Level + Life Cycle approach**
 - Includes fault recovery, supply chain issues, expected misuse
- **Reference lists to improve completeness**
 - Prompts & epistemic defeaters for coverage (#DidYouThinkofThat?)



■ System level safety for autonomous operation & lifecycle

