INTRODUCTION

• Autonomous vehicles are at the verge of adoption
• Adoption rate depends on transparency to the end user

OBJECTIVES

• Analyze SHRP2 data and identify the naturalistic driving behavior
  • Case one - headway distance

DATA SOURCE

• Radar data from ~3,800 trips analyzed from SHRP2
• Trip duration of 17-24 minutes to assure consistent spectrum of road conditions
• Overall about 20 timestamped data channels from:
  • Radar:
    – Range headway and lateral
    – Left and right lane distance
  • Gyroscope
    – Accelerations and angular velocities
  • Vehicle network
    – Vehicle speed

METHOD

• Radar captures objects within 200m ahead and ±40m laterally

• Data filtration use to identify steady targets that:
  – Are within 2.25 m laterally, assuming that the standard lane width is 4.5 m (15 ft.).
  – Consecutive record of the object for at least 10 seconds to avoid “ghost target” records.
  – Headway gap change <2 m/s (<5 mph) to be considered as steady state car following.

RESULTS

• Clear relation between driving speed and headway
  – At low speeds to <70 km/h nearly linear
  – At higher speeds >80 km/h average headway flattens to 40m

CONCLUSION

• Headway distance can be a signature for the driving style
• Tree distinct driving behavior identified
  – Cautious
  – Average
  – Aggressive
• Open topics, influence of:
  – Traffic Conditions
  – Driving environment, city vs rural
  – Driving situation, off-ramp, merging, etc.

REFERENCES

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