Coordinate Systems
Discussion Basis

16.04.2021 – René Paris, Christoph Kochendörfer
Current COS


d//\     t
\   /             „Actually a  
\ /              mixture of road 
//              and lane“      
\   /                   
\ /                    
//                   
//                   lateral
\   /                   
\ /                    
//              longitudinal
\   /                   
\ /                    
//                   

World       Road       Agent
World Sampling
Sample case

3 Lanes, one getting smaller
**Sample case**

Issues with the s/t coordinate system

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**s/t Coordinate System**

**What does the s reference to?**
- LANE: Different coordinates depending on curvature of Road → Caused several Bugs in the past
- ROAD: Foreshortening of s depending on curvature of Road → Is this a problem?

**What does the t reference to?**
- LANE: +/- with respect to reference line → Currently implemented
- ROAD: +/- with respect to reference line → Would change everything
Sample case
Mixed coordinate system

s/t Coordinate System

What does the s reference to?
✔ LANE: Different coordinates depending on curvature of Road → Caused several Bugs in the past
✔ ROAD: Foreshortening of s depending on curvature of Road → Is this a problem?

What does the t reference to?
✔ LANE: +/- with respect to reference line → Currently implemented
✔ ROAD: +/- with respect to reference line → Would change everything

Consequence
✔ Mixed coordinate system
Corner cases
Limit to $[0, s_{\text{max}}]$
How long is a car (or a gap)?
Road Boundary Issue
Measuring Lateral Distances
Thank you for your attention