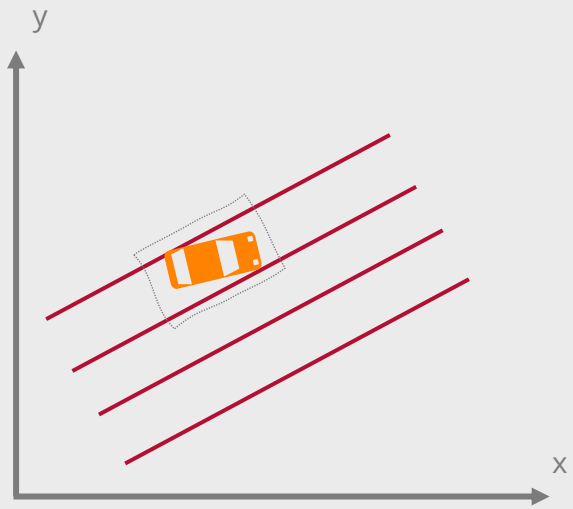
# Coodinate Systems

## Discussion Basis

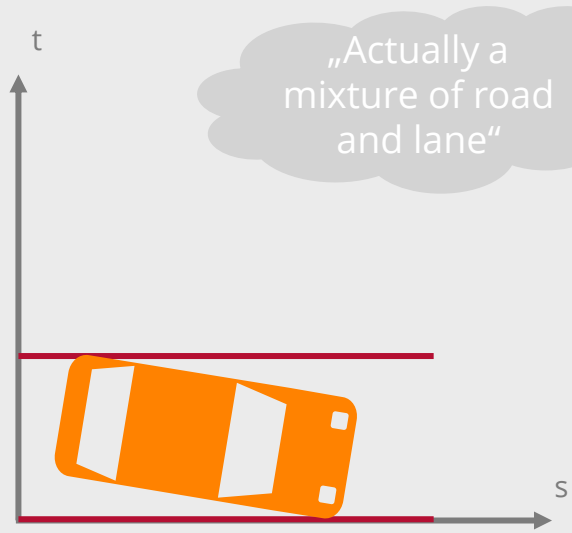
16.04.2021 – René Paris, Christoph Kochendörfer

openPASS

intech

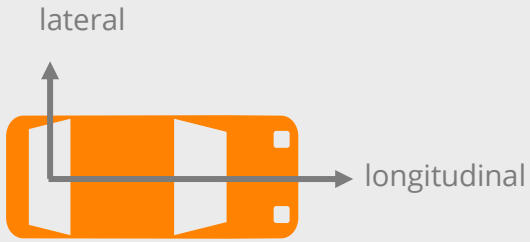



World



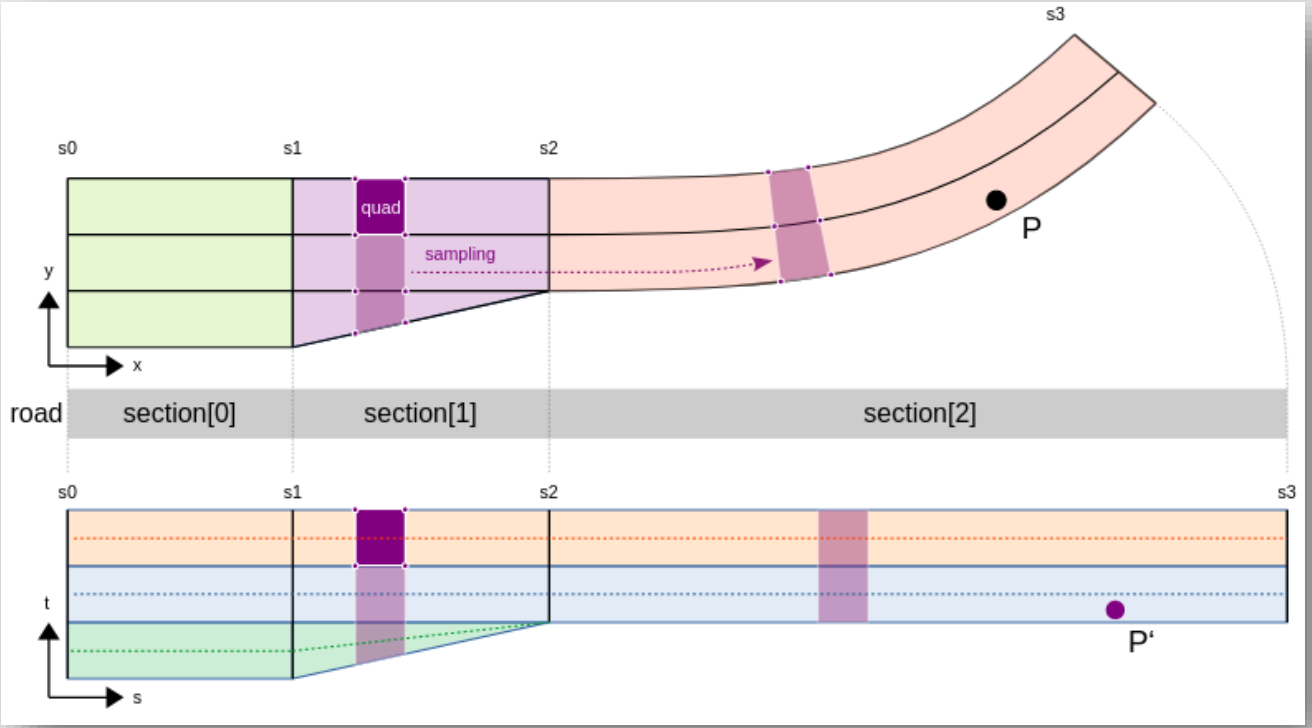

Road

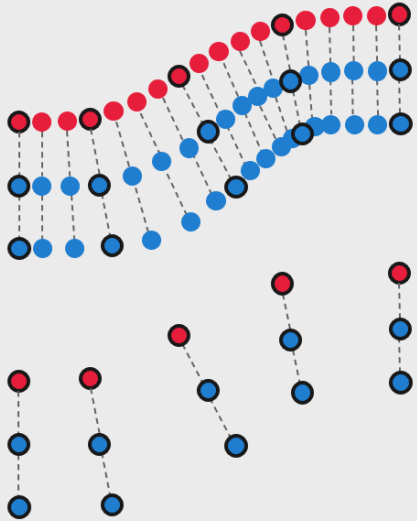
„Actually a mixture of road and lane“



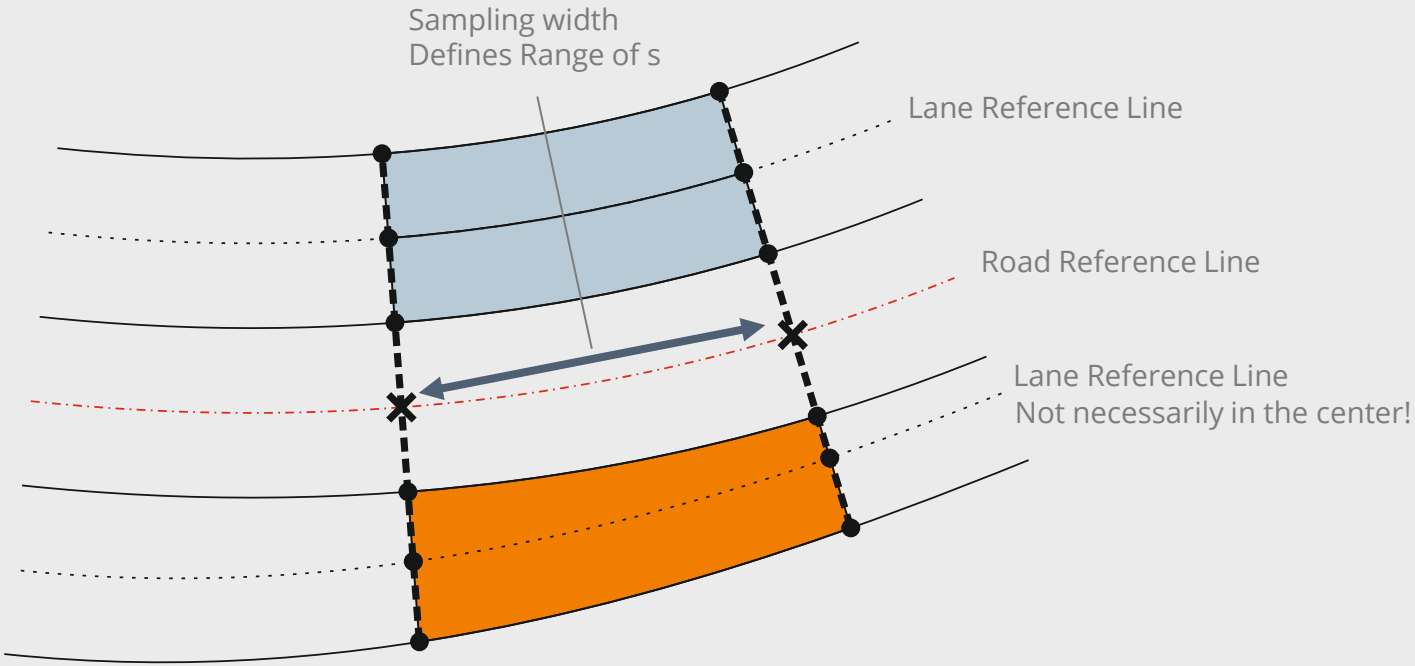

Agent

# Current COS



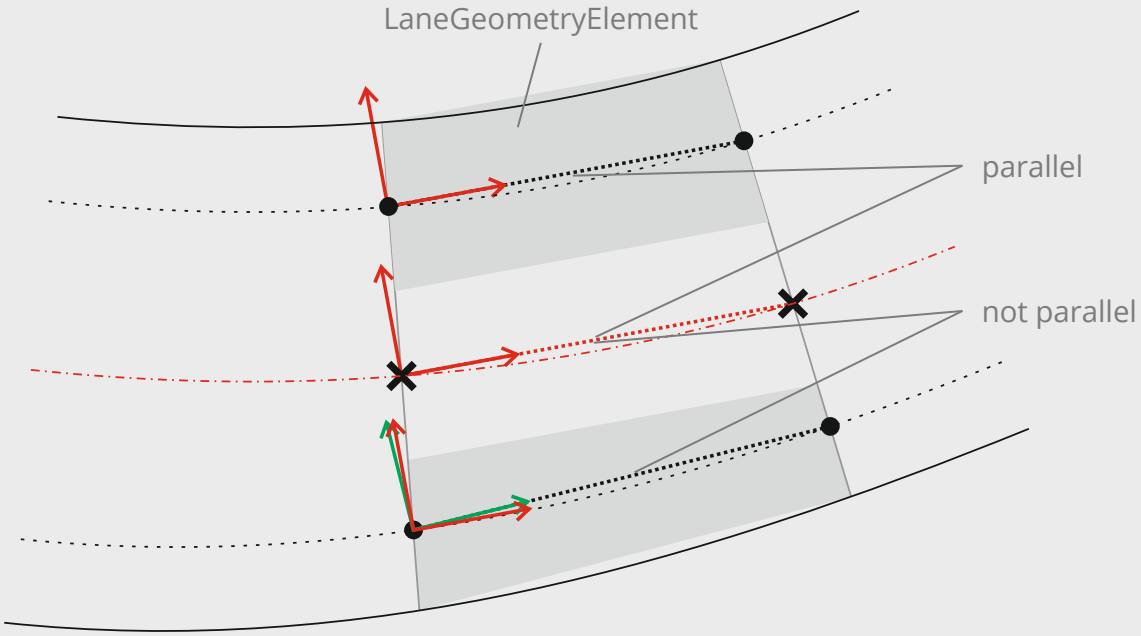



# World Sampling




# Sample case

**3 Lanes, one getting smaller**




## s/t Coordinate System

**What does the s reference to?**

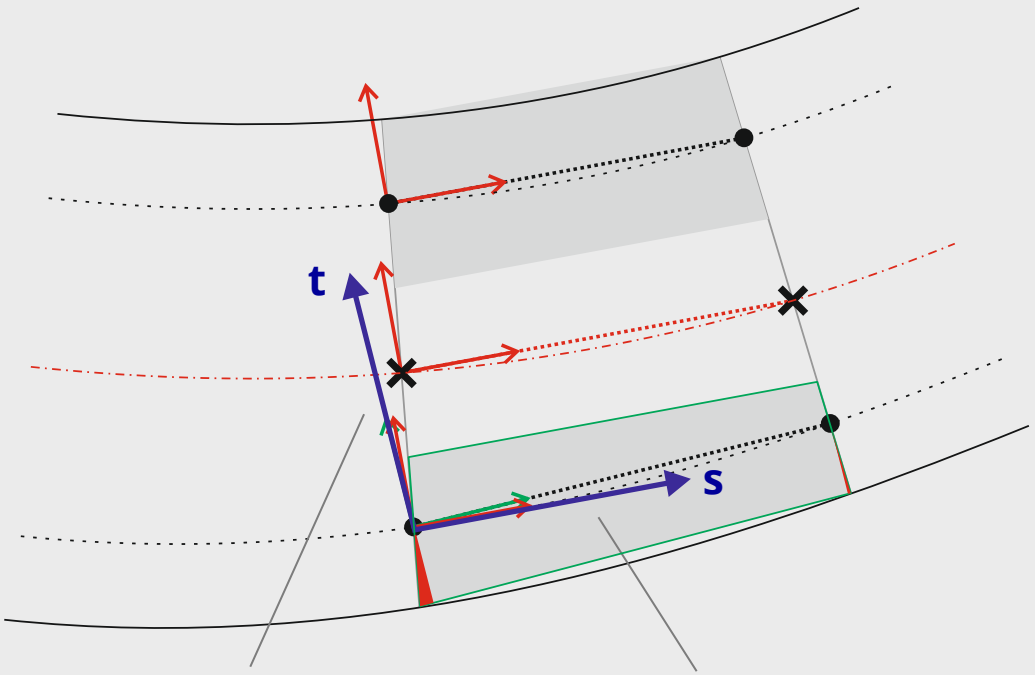
- ✔ LANE: Different coordinates depending on curvature of Road
  → Caused several Bugs in the past
- ✔ ROAD: Foreshortening of s depending on curvature of Road
  → Is this a problem?

**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

**Issues with the s/t coordinate system**




Respect rotation w.r.t. road line

Respect stretch along s with respect to road line

## 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?**

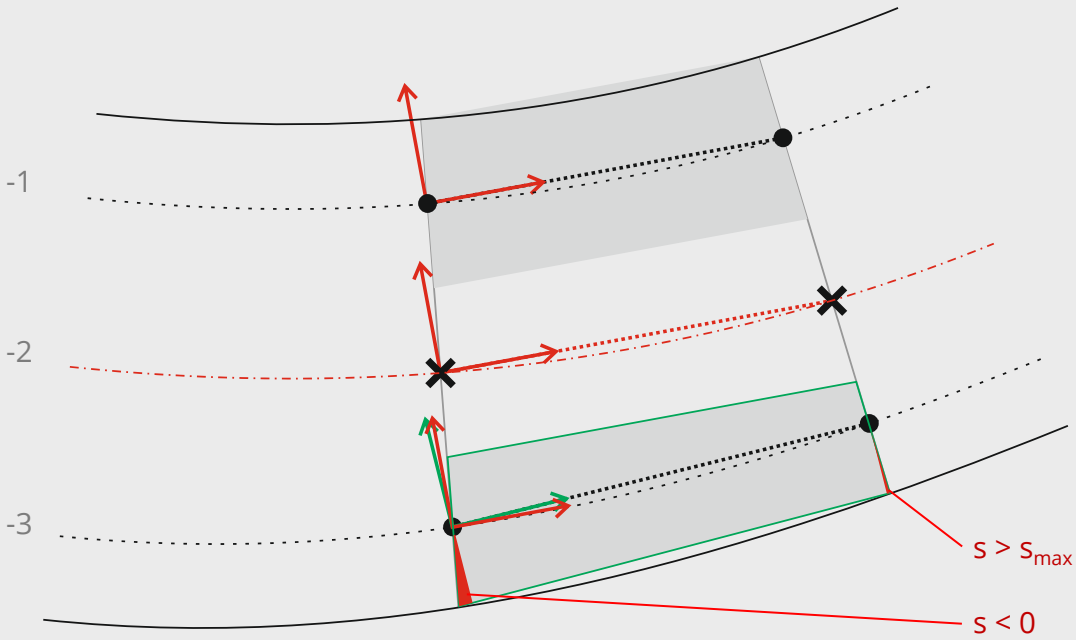
- ✔ LANE: +/- with respect to reference line
  → Currently implemented
- ✔ ROAD: +/- with respect to reference line
  → Would change everything

**Consequence**

- ✔ Mixed coodinate system

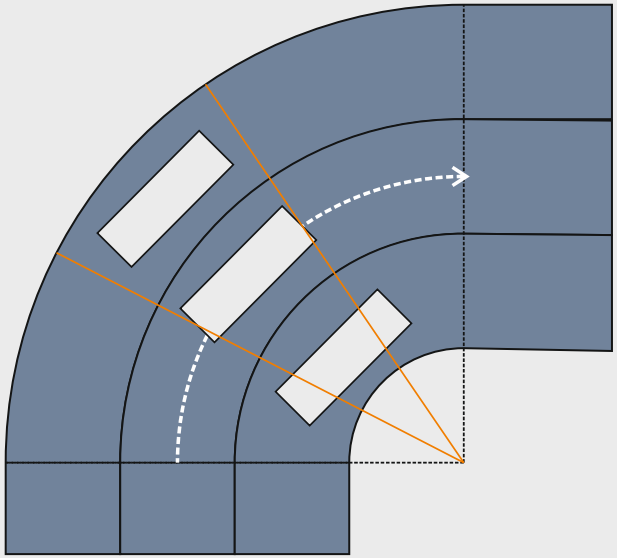
# Sample case

## Mixed coordinate system



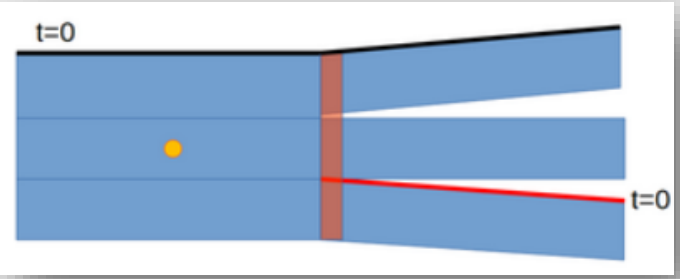

# Corner cases

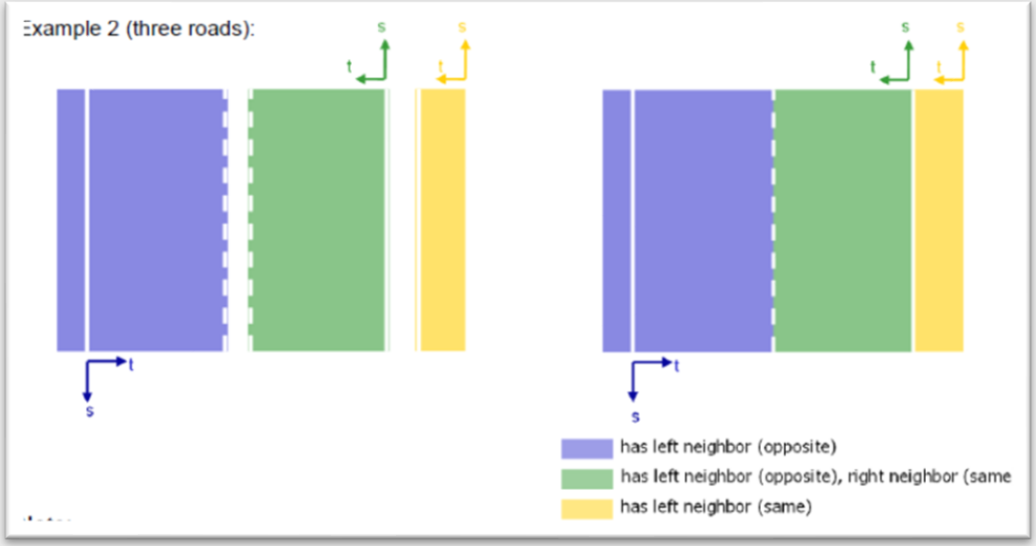
**Limit to [0, $s_{max}$]**



# How long is a car (or a gap)?

intech




# Road Boundary Issue

## Measuring Lateral Distances

# Thank you for your attention