Meeting Minutes: Abstract Environment API, Map Layer 1, 26.04.2021

Common

- Compile-time vs. Run-time MantleAPI.

Mathematical based types: vector, point, polygon etc.

- As close as possible to OSI standard.
- ABI compatible. Cast should be possible between OSI and MantleAPI types.
- Basic types will be provided and declared in MantleAPI.
- Additional requirements will be communicated to OSI. Inspect OSI types.
- Distinguish between types and algorithms.
- Examine possibility to use of open source libraries in MantleAPI.

Map based types/coordinate systems: road/lane positions etc.

- Map types for Lane and Road based on OpenDRIVE specification. No relation between them (inheritance etc.). Align with Andreas Bauer.

Converter, Microscopic Queries

- Classes/interfaces for different queries/converters (currently ICoordConverter and ILaneLocationQueryService)? -> Decision: One interface/class per cluster.

- Conversion of different road types (ICoordConverter):

    - Road -> Lane
    - Road -> Inertial
    - Lane -> Road
    - Lane -> Inertial
    - Inertial -> Lane
    - Inertial -> Vector(Lane)
    - Inertial -> Road
    - Road -> Lane
    - Road -> GPS
    - Lane -> Road
    - Lane -> GPS
    - GPS -> Lane
    - GPS -> Road
    - **Elaborate a sophisticated C++ query method.**

- Road Queries:

    - Road Curvature
    - Lane Curvature

- Road h, p, r (normal vector)
- Lane h, p, r
- Road h', p', r' (e.g. yaw rate)
- Road/Lane friction
- Road/Lane z-value
- Lane width
- ... (Complete in course of development)
- One query per road/lane of e.g. heading or just one and use converter.

Macroscopic Road/Lane Queries

- Route,
- **Graph**:
  - Navigational aspects (Shortest path etc.), Reference line specific
  - Lane: Successor, Predecessor (Longitudinal)
  - Lane: Adjacent relationships (left, right), logical, e.g. in driving direction?
  - Lane properties (edge weights): Traffic signs, lane markings, length etc.