1. TraCI Wrapper Class

Purpose: - connects Java to sumo
- TraCI Commands
- gets data from sumo

attributs: String host
int port
boolean connected

methods: connect ( )
close ( )
simulationStep ( )
List <String> getVehicleIDs ( )
List< String> getTrafficlight IDs ( )
String getTrafficLightState (String ID)
void setTrafficLightState (String id, String state

2. Simulation Controller

Purpose: - Controlls the Simulation (start, stop, step)
- works together with TraCI Wrapper
- updates/processes vehicleobjects and trafficlightobjects
- gives gui information (new data)

attributs : - TraCI Wrapper traci
- string config path
- List < Vehicle> vehicles
- List <TrafficLight> trafficLights

methods : - start Simulation ( )
- step ( )
- stop Simulation ( )
- load vehicles ( )
- load Trafficlights ( )

3. Vehicle class

purpose :- vehicle data

attributes : - String id
- double[] x,y
- double speed
- string route id

methods: updateFromSumo()
getPosition()
get speed()
set speed

4. TrafficLight

purpose: - Trafficlight data
- control Traffic light

attributes: string id
string current phase
int phase Index

methods :- update From Sumo()
- set phase (String phase)
- get phase ()

5. MapModel

purpose: model for the structure of the road network (street/road data)
attributes :- List (Edge) edges
- List<Intersection> intersections
methods: load (rom Sumo()
- getEdges()
- getIntersection()

class 6. Edge

purpose: represents a single road segment between two
intersections in the sumo network

    attributes: String id
             String fromIntersectionId
             String toIntersectionId
             double length
             double speedlimit

    methods: Edge (string id, String fromIntersection id, String
                       to Intersection id
             String get Id ()
             String get From Intersection Id ()
             String getTo Intersection Id ()
             double getLength ()
             double get Speed Limit ()

Class Intersection

purpose: Represents a node where multiple edges meet in
          the road network

    attributes: String id   → ID (from junction code)

methods: Intersection (string id)
          String get Id ()

Architecture Diagramm

GUI Layer

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Simulation Controller

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TraCI Wrapper

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Sumo