DCS Final Project

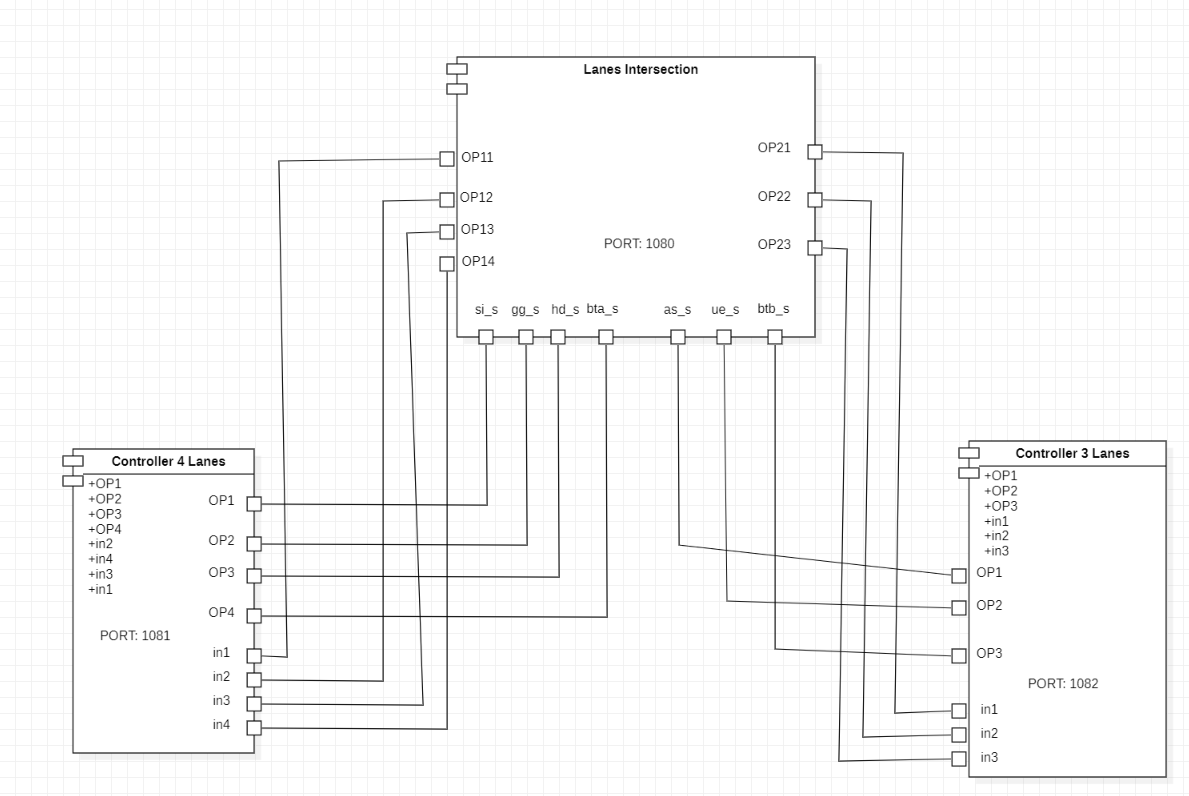
**Team Name:** Miau

**Team members:** Socaci Cristian Marius

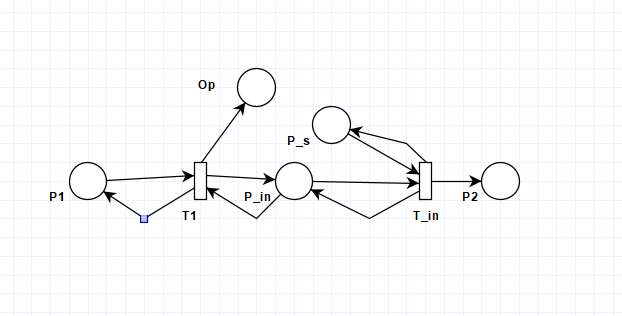
Varga Andrei

Dioane Radu-Alexandru

# Component diagram for the controllers and the two intersections



1. **OETPN model for the lane (the one with the input channel)**

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## Transitions guards and mappings:

T1 guard: if (P1 != null) and (P\_in CanAddCars)

Mappings: P\_in AddElement from P1

Guard: if (P1!=null) and (P\_in CanNotAddCars)

Mappings:(OP SendOverNetwork “full”),(P1 copy to P1)

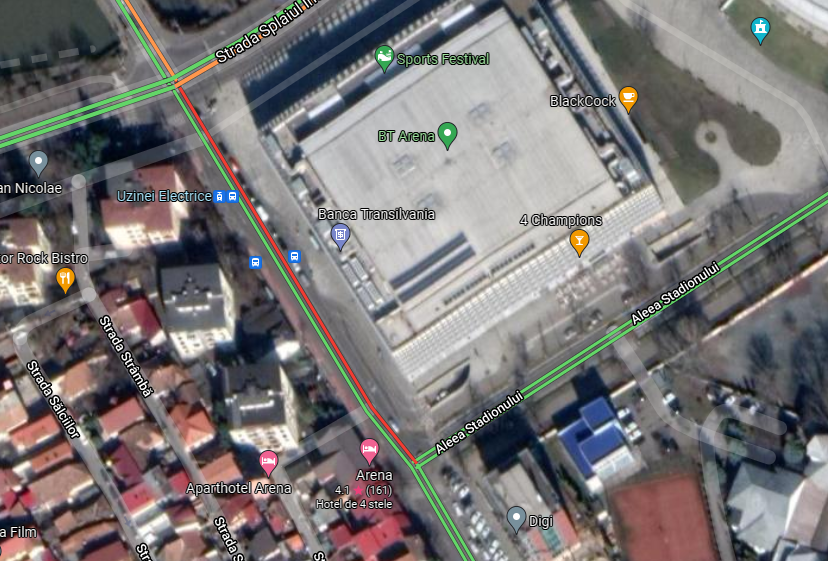
T\_in guard: if (P\_s == “green”) and (P\_in HaveCar)

Mapping1: P\_in PopElementWithoutTarget to P2

Mapping2: P\_s Move to P\_s

# The two intersections from Google Maps and the OETPN model

## Screenshot of the two intersections from Google Maps:

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**Screenshots from Google Maps for the 4-way intersection:**

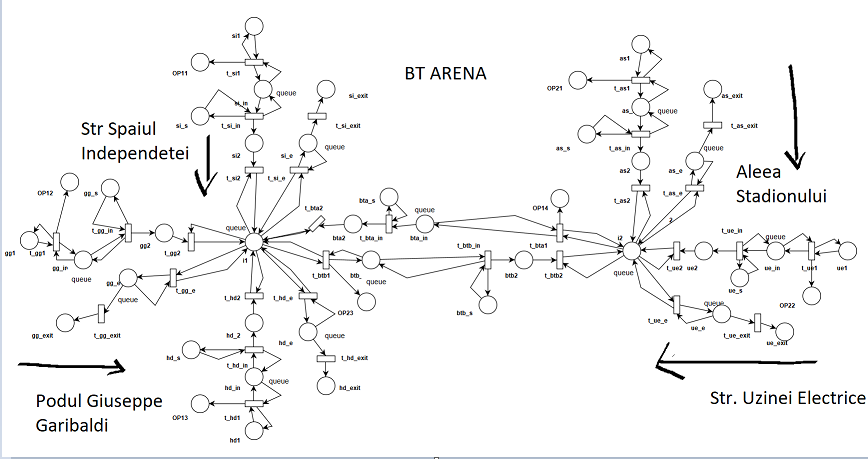
## Lane 1 (right one) and 2 (middle one):

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**Lane 3 ( middle one) and Lane 4 ( left one):**



# OETPN model of the two intersections:



## Transitions guards and mappings:

## T\_si1 guard : if (si1 NotNull) and (si\_in CanAddCars)

## Mappings : si\_in AddElement From si1

Guard: if (si1!=null) and (si\_in CanNotAddCars)

Mappings:(OP11 SendOverNetwork “full”),(si1 copy to si1)

Similar guards and mappings for T\_gg1,T\_hd1,T\_as1,T\_ue1

T\_bta1 guard: if (i2 HaveCarForMe) and (bta\_in CanAddCars)

Mappings: i2 PopElementWithTargetToQueue to bta\_in

Guard: if (si2!=null) and (bta\_in CanNotAddCars)

Mappings:(OP14 SendOverNetwork “full”),(i2 copy to i2)

Similar guards and mappings for T\_btb1

## T\_si\_in guard : if (si\_s == “green”) and (si\_in HaveCar)

## Mappings : si\_in PopELementWIthoutTarget To si2 , si\_s Move to si\_s

## Similar guards and mappings for T\_gg\_in,T\_hd\_in,T\_bta\_in,T\_btb\_in,T\_as\_in,T\_ue\_in

## T\_si2 guard : if(si2 NotNull) and (i1 CanAddCars)

## Mappings : i1 AddElement From si2

## Similar guards and mappings : T\_gg2, T\_hd2, T\_bta2, T\_btb2, T\_as2, T\_ue2

## T\_si\_e guard: if (i1 HaveCarForMe) and (si\_e CanAddCars)

## Mappings: i1 PopElementWithTargetToQueue si\_e

## Similar guards and mappings for T\_gg\_e, T\_hd\_e, T\_as\_e, T\_ue\_e

## T\_si\_exit guard: if (si\_e HaveCar)

## Mappings: si PopElementWithoutTarget to si\_exit

## Similar guards and mappings for T\_gg\_exit, T\_hd\_exit, T\_as\_exit, T\_ue\_exit

# Experiment

During the experiment 3 cars have been sent through the 2 intersection that we had designed. They started in the place si1 and their first target was the t\_btb1 transition which is the one of the output lanes of our first intersection and in the same time the input lane to our second intersection (the connector transition if it can be put that way). After arriving into our second intersection, the car will search for the desired exit which in our case is the transition t\_as\_e and will end in the as\_exit place which means, it successfully covered our imposed path.