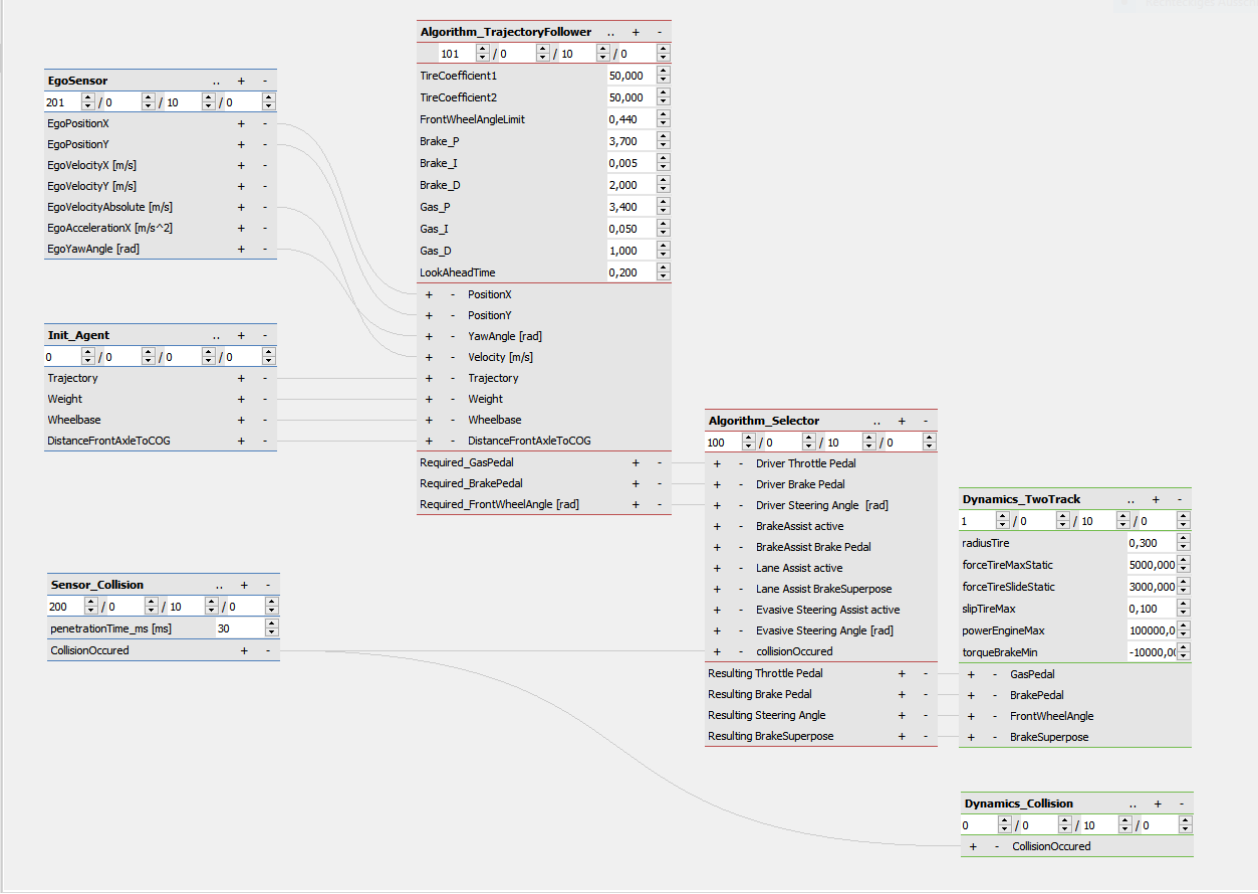
EXTENSIONS OF THE XML FILE FOR THE HIERARCHICAL SYSTEM EDITOR

STATE OF THE ART: OPENPASS GUI



existing system editor allows for building several independent systems

<u>problems</u>:

1. user looses overview if many components are included
2. repeating constructions have to be copied

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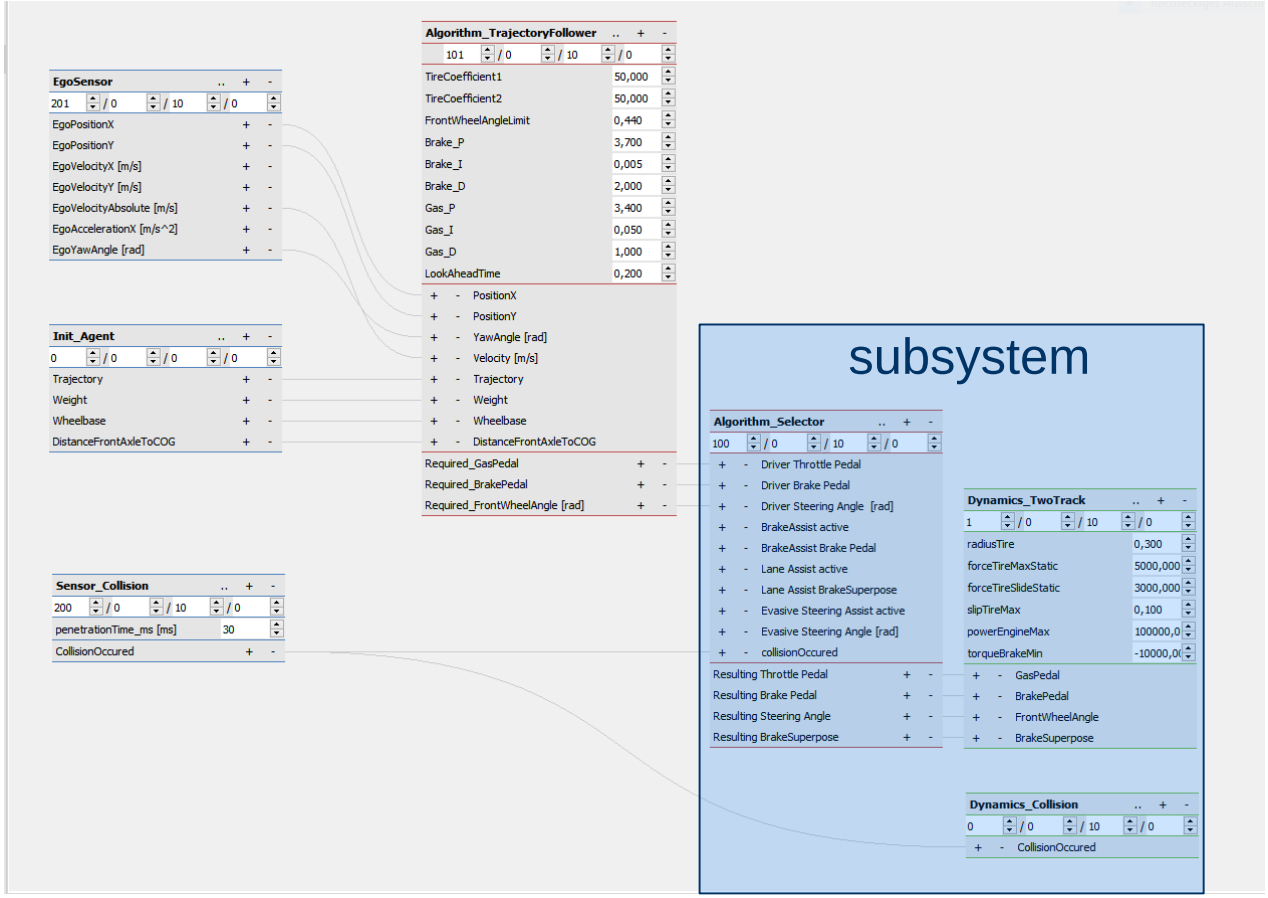


existing system editor allows for building several independent systems

<u>problems</u>:

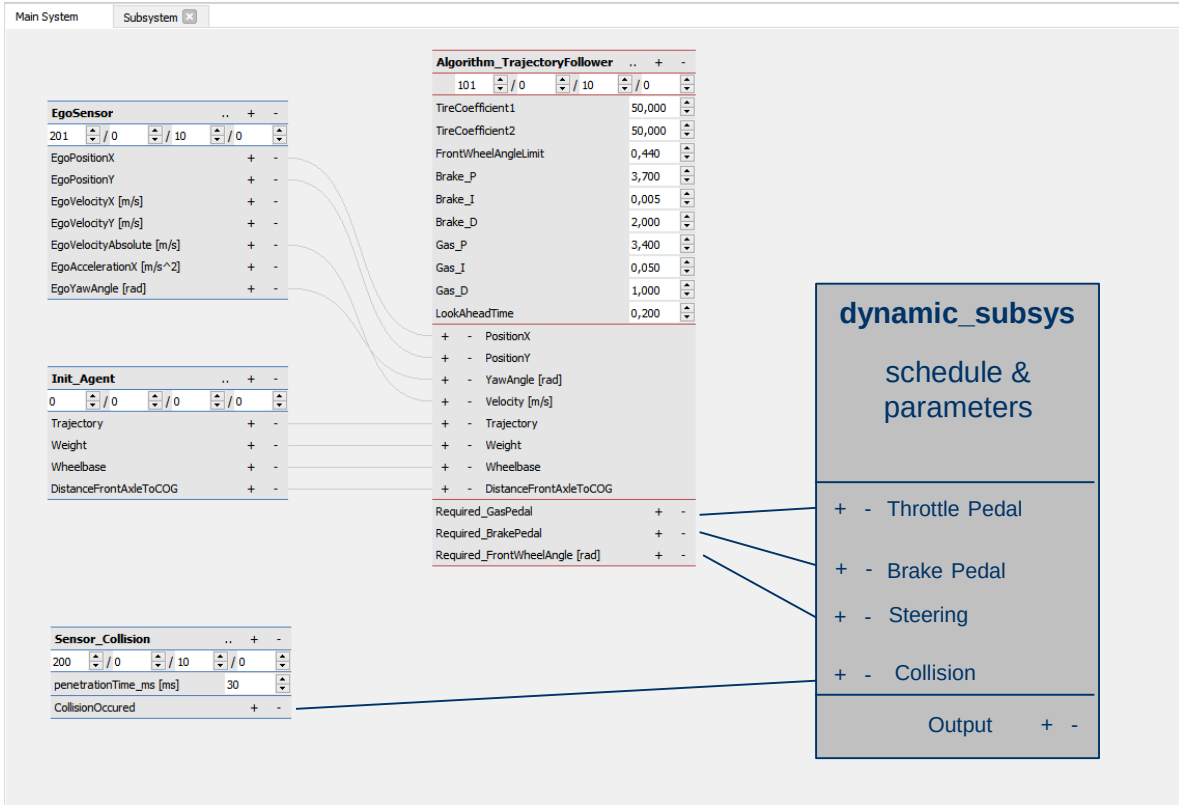
1. user looses overview if many components are included
2. repeating constructions have to be copied

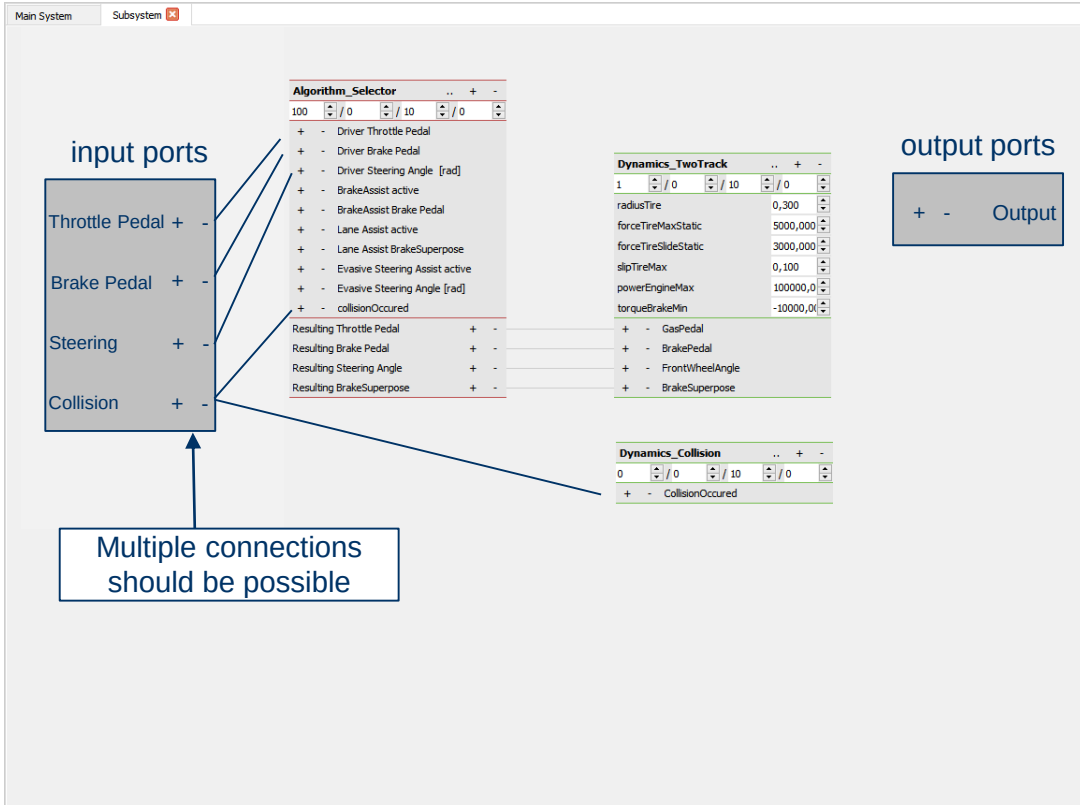
<u>idea: hierarchical system editor</u>

grouping components and their connections to subsystems (e.g. as in Simulink)

PERSPECTIVE: HIERARCHICAL SYSTEM EDITOR

system XML file

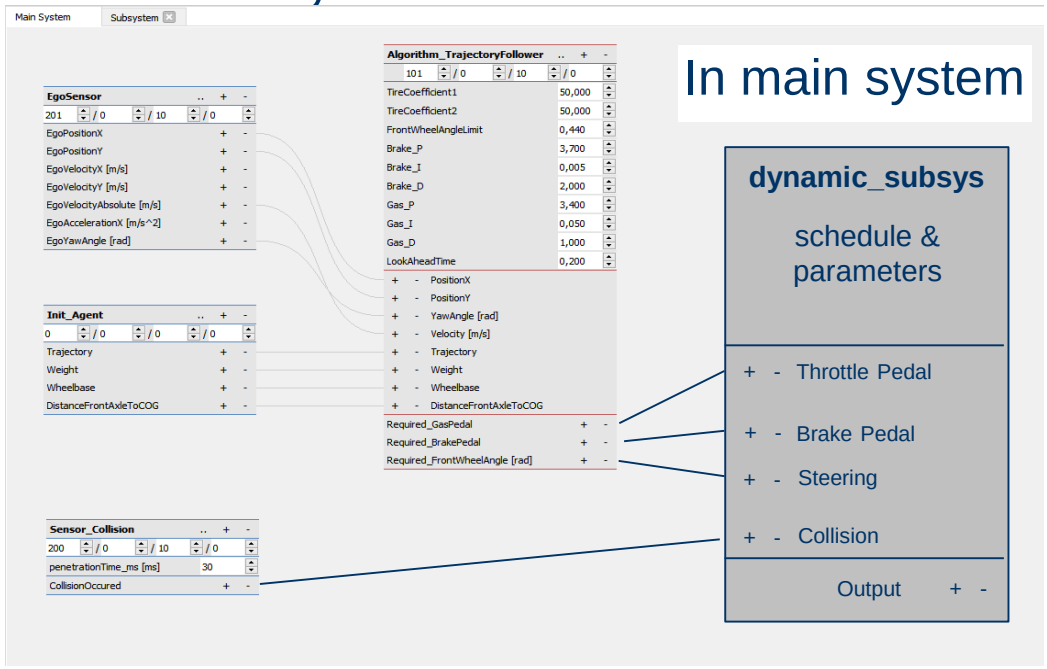




NEW TYPE SUBSYSTEM: COMBINATION OF SYSTEM AND COMPONENT PROPERTIES

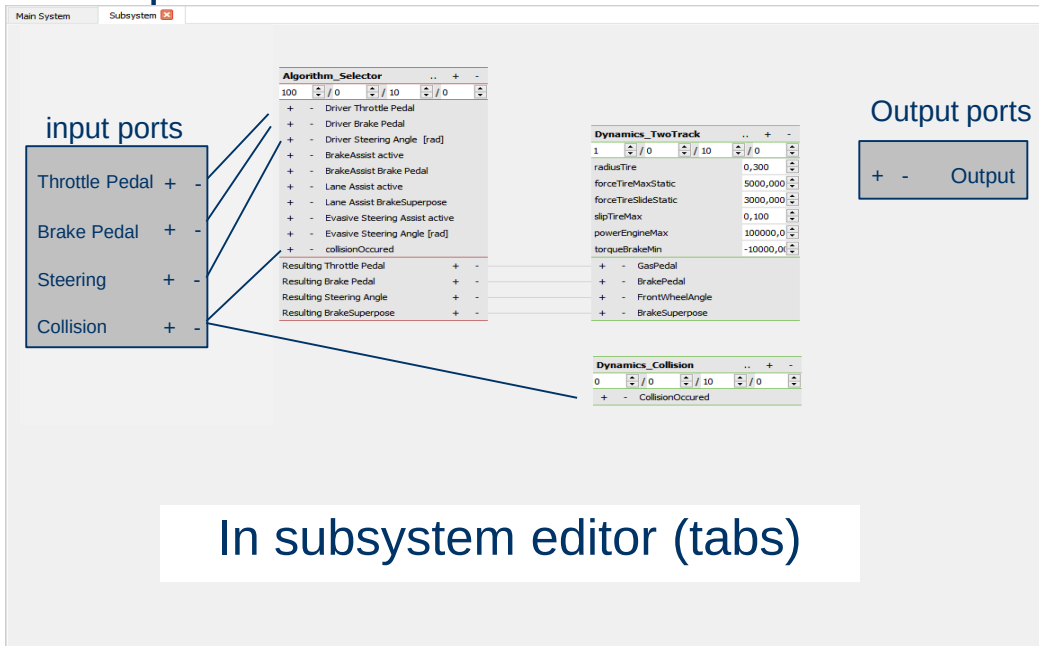
Subsystems behave as components:

- inputs, outputs, parameters and schedule
- they can be connected to components or other subsystems



Subsystems behave as systems:

- they consist of multiple components
- they consist of connections between components



NECESSARY EXTENSIONS OF THE XML FILE STRUCTURE

1. Embedding into the existing XML file

```
<?xml version="1.0" encoding="UTF-8"?>
<systems>
    <system>
     ...
    </system>
</systems>

<subsystems>
   <subsystem>
   …
   </subsystem>
</subsystems>
```

todays system XML file is contained and **not modified**!

global definition of subsystems

2. Basic XML skeleton of a subsystem

```
<subsystem>
   <id/>
   <title/>
   <schedule/>
   <parameters/>
   <inputs/>
   <outputs/>
   <components/>
   <connections/>
</subsystem>
```

Inherited from type **component**

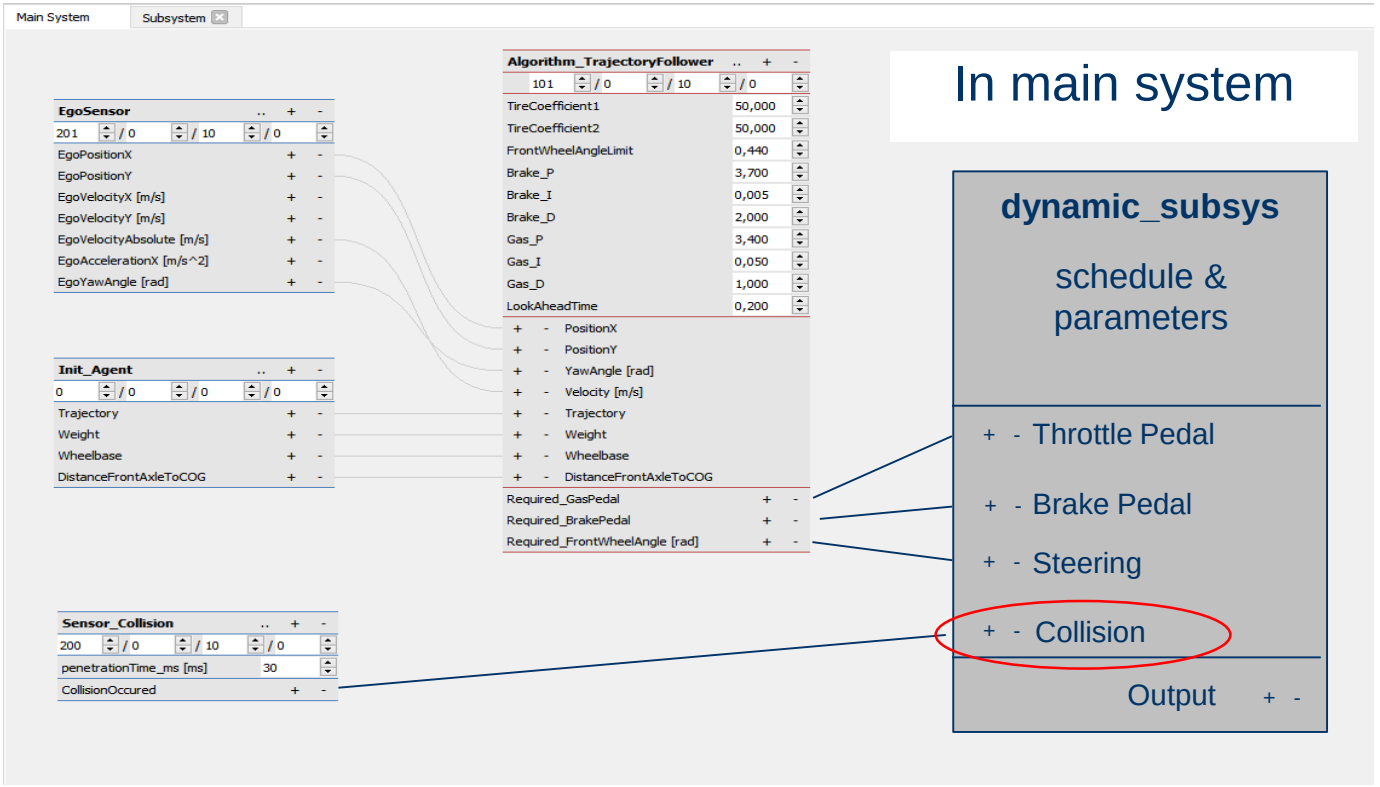
Inherited from type **system**

NECESSARY EXTENSIONS OF THE XML FILE STRUCTURE

3. Definition of the subsystem as a component in the main system

```
<systems>
  <system>
    <components>
      ....
      <component>
        <id> 4 </id>
        <library> $subsystem:0$ </library>
        <title> dynamic_subsys </title>
        <schedule>
          …
        </schedule>
        <parameters/>
      </component>
    </components>
  </system>
</systems>
```

definition of an subsystem as a component

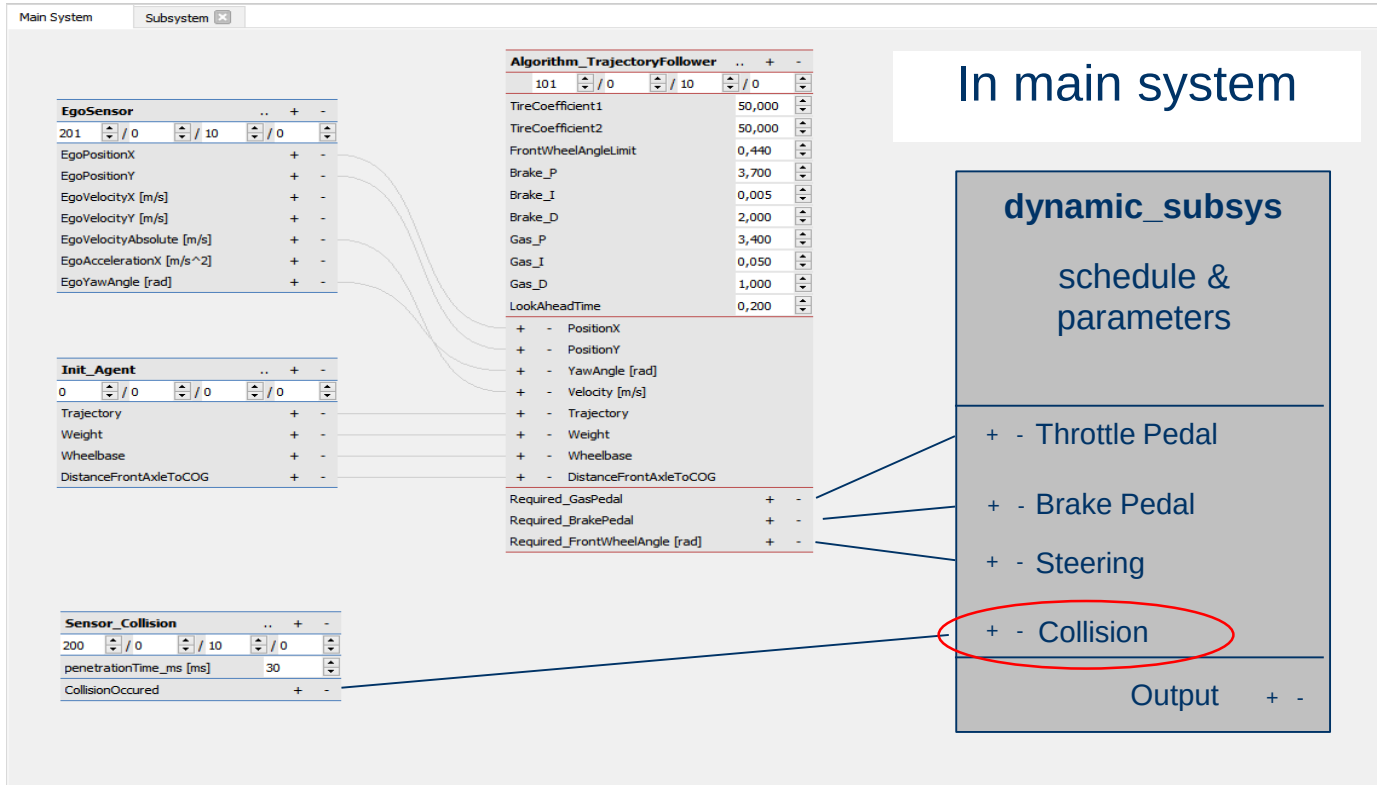


NECESSARY EXTENSIONS OF THE XML FILE STRUCTURE

3. Definition of input, output and parameter items as in component XML file

```
<subsystems>
  <subsystem>
    <inputs>
      ....
      <input>
        <id> 3</id>
        <title> Collision </title>
        <type> bool </type>
        <unit> </unit>
      </input>
    </inputs>
  </subsystem>
</subsystems>
```

definition of an input

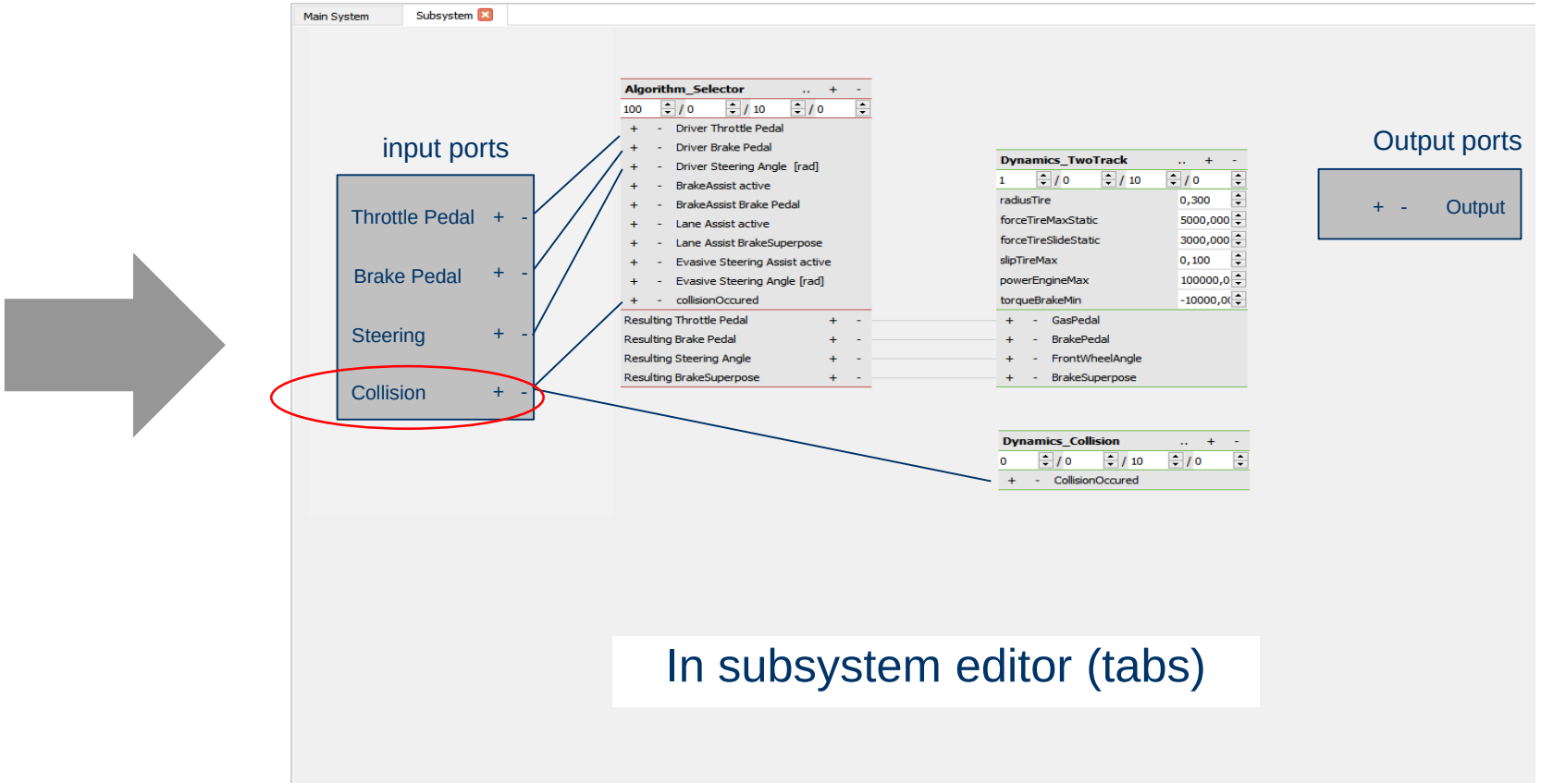


NECESSARY EXTENSIONS OF THE XML FILE STRUCTURE

4. Definition of input, output and parameter items as in component XML file

```
<subsystems>
  <subsystem>
    <inputs>
      ….
      <input>
        <id> 3</id>
        <title> Collision </title>
        <type> bool </type>
        <unit> </unit>
      </input>
    </inputs>
  </subsystem>
</subsystems>
```

definition of an input

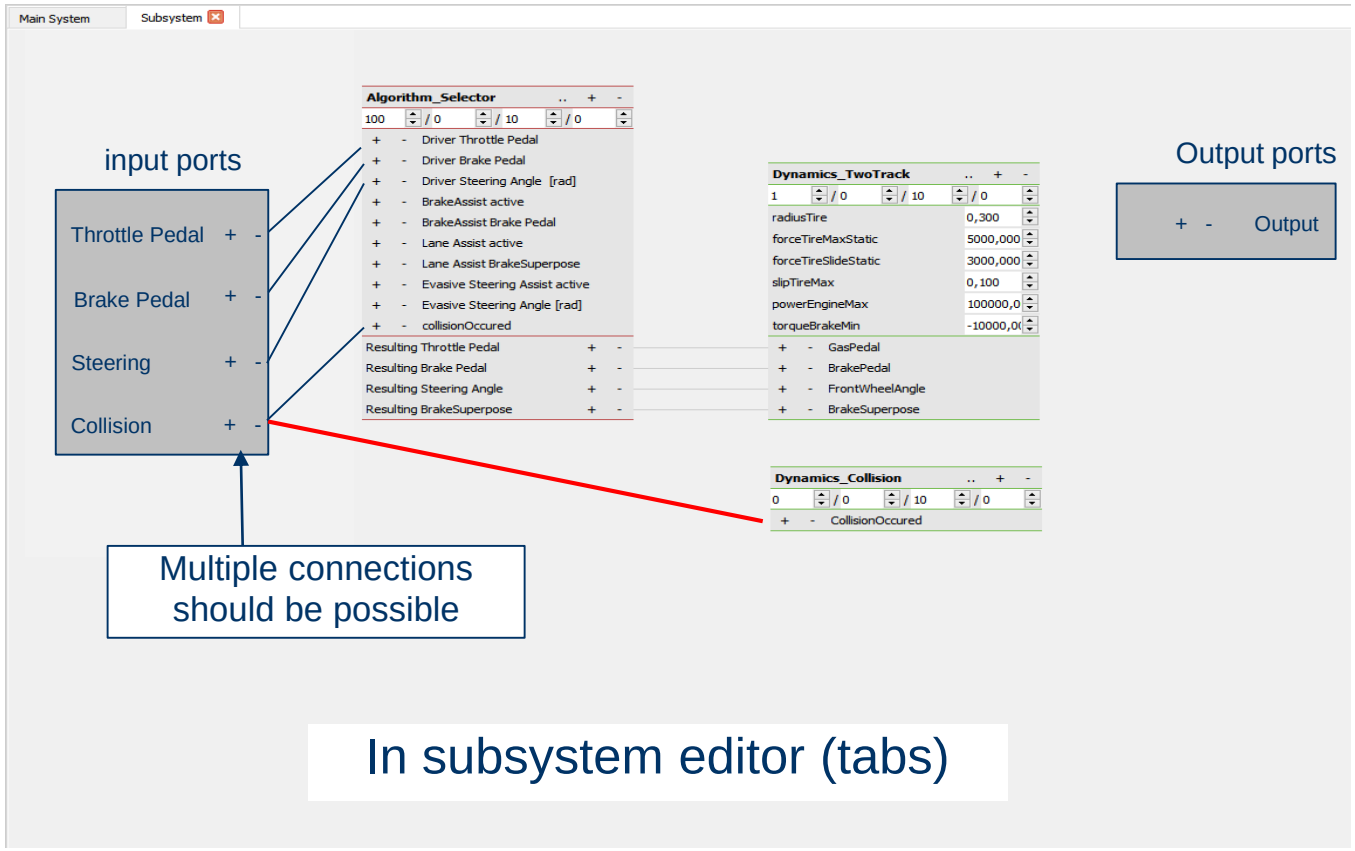


NECESSARY EXTENSIONS OF THE XML FILE STRUCTURE

5. Connections between inputs/outputs and components similar to system XML file

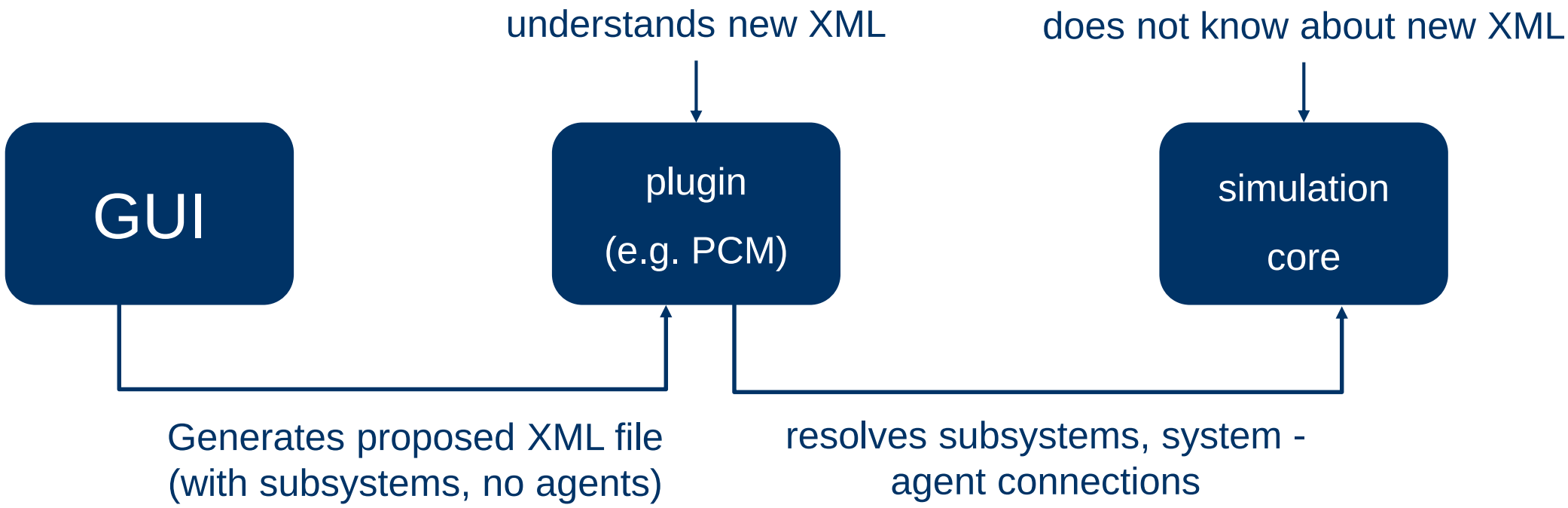
```
<subsystems> <subsystem>
  <inputconnections>
    <inputconnection>
      <id>0</id>
      <source> 3 </source> <!-- input ID-->
      <target>
        <component> 3 </component>
        <input> 0 </input>
      </target>
    </inputconnection>
    …
  </inputconnections>
</subsystem> </subsystems>
```

connection between component and input



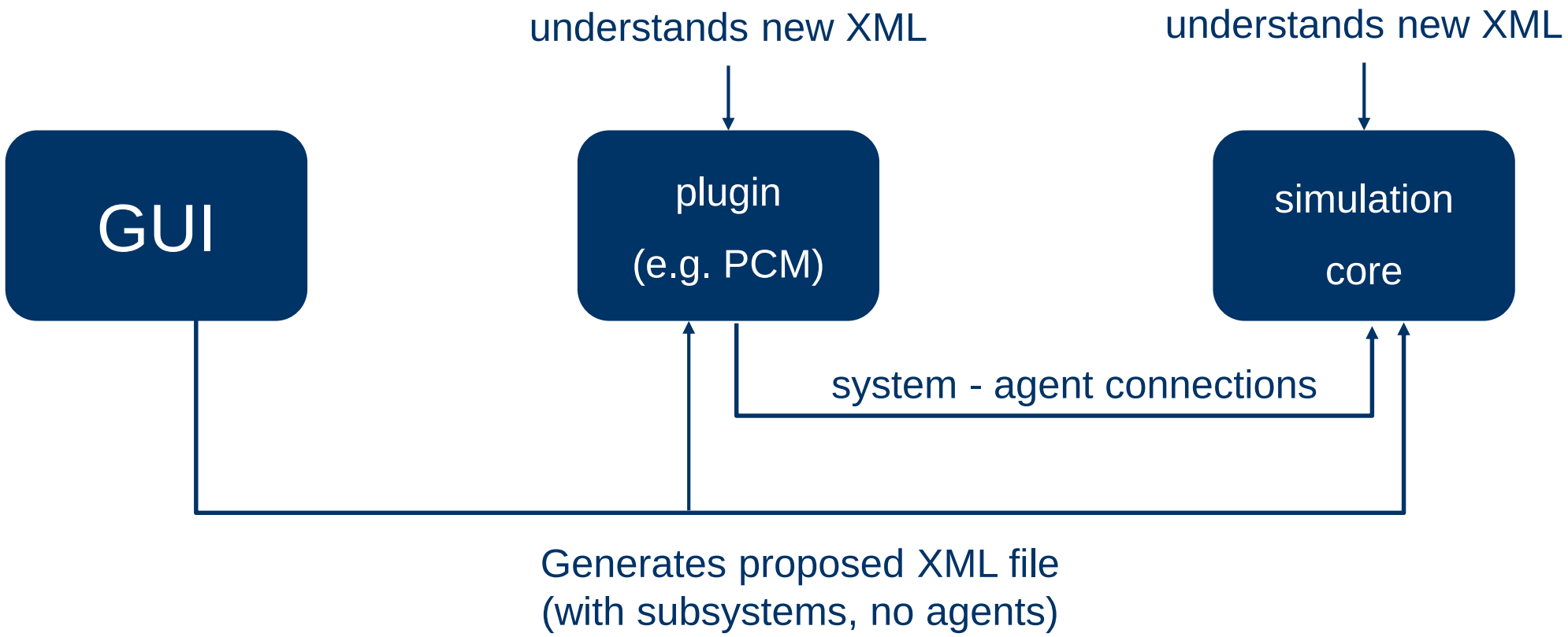
INCORPORATING THE NEW XML STRUCTURE INTO THE FRAMEWORK

Option 1: plugins have to resolve the subsystems (i.e. translate to old XML file structure)



INCORPORATING THE NEW XML STRUCTURE INTO THE FRAMEWORK

Option 2: everything understands the new XML structure



CONCLUSIONS

Hierarchical system editor

- Definition of a new object type subsystem
- Subsystems act as both systems and components
- Creating and editing subsystems yields a benefit in usability
- **XML file structure has to be extended for defining subsystems**

Points to be decided on

- Confitmation of the new XML file structure
- How to incorporate the new XML file structure into the framework (option 1 or 2)