

Open Source Simulation with OSTAR

Open Source Toolchain für Automotive Research

Final Event Project Results

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01 | Software in a marketplace

Software in a marketplace

- What to do in a marketplace?

- Buy data



- Use software



- Use data and software



- Add analysis software

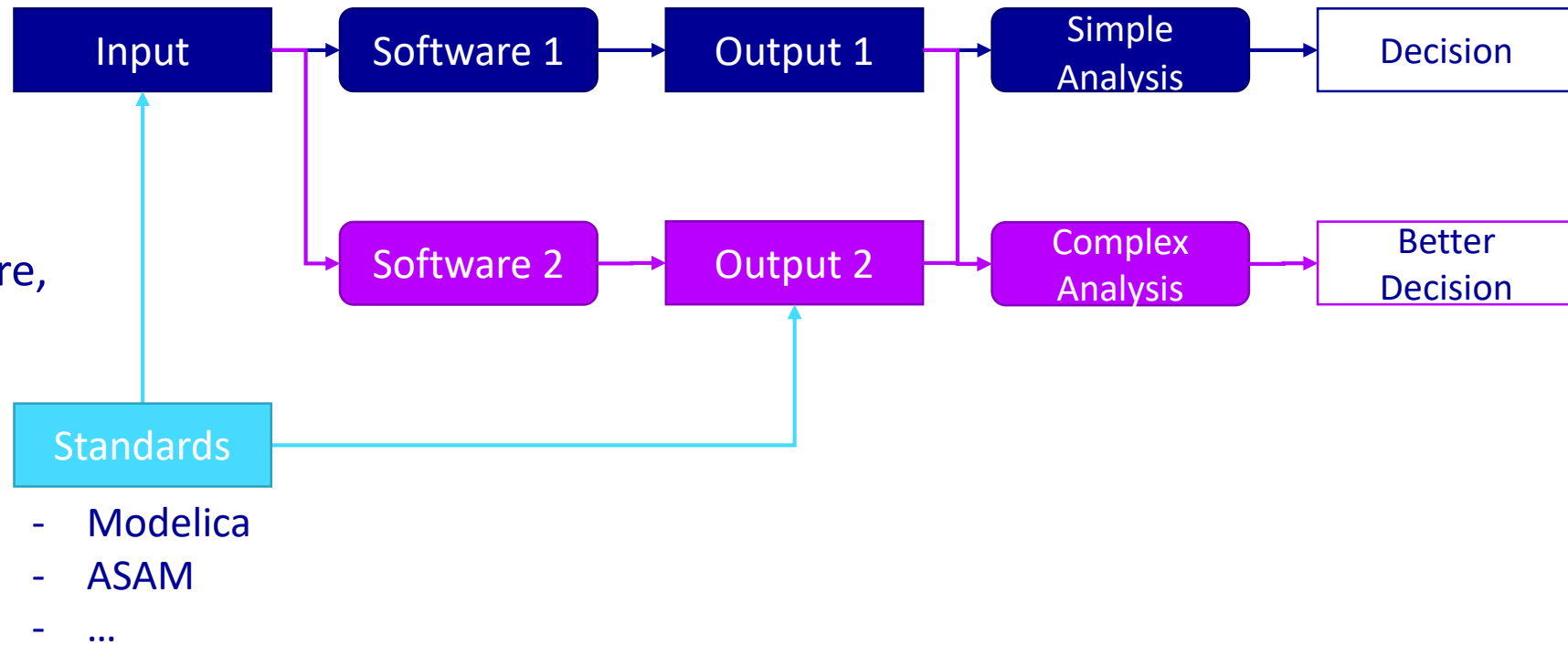


Software in a marketplace

- What to do in a marketplace?

- Use software

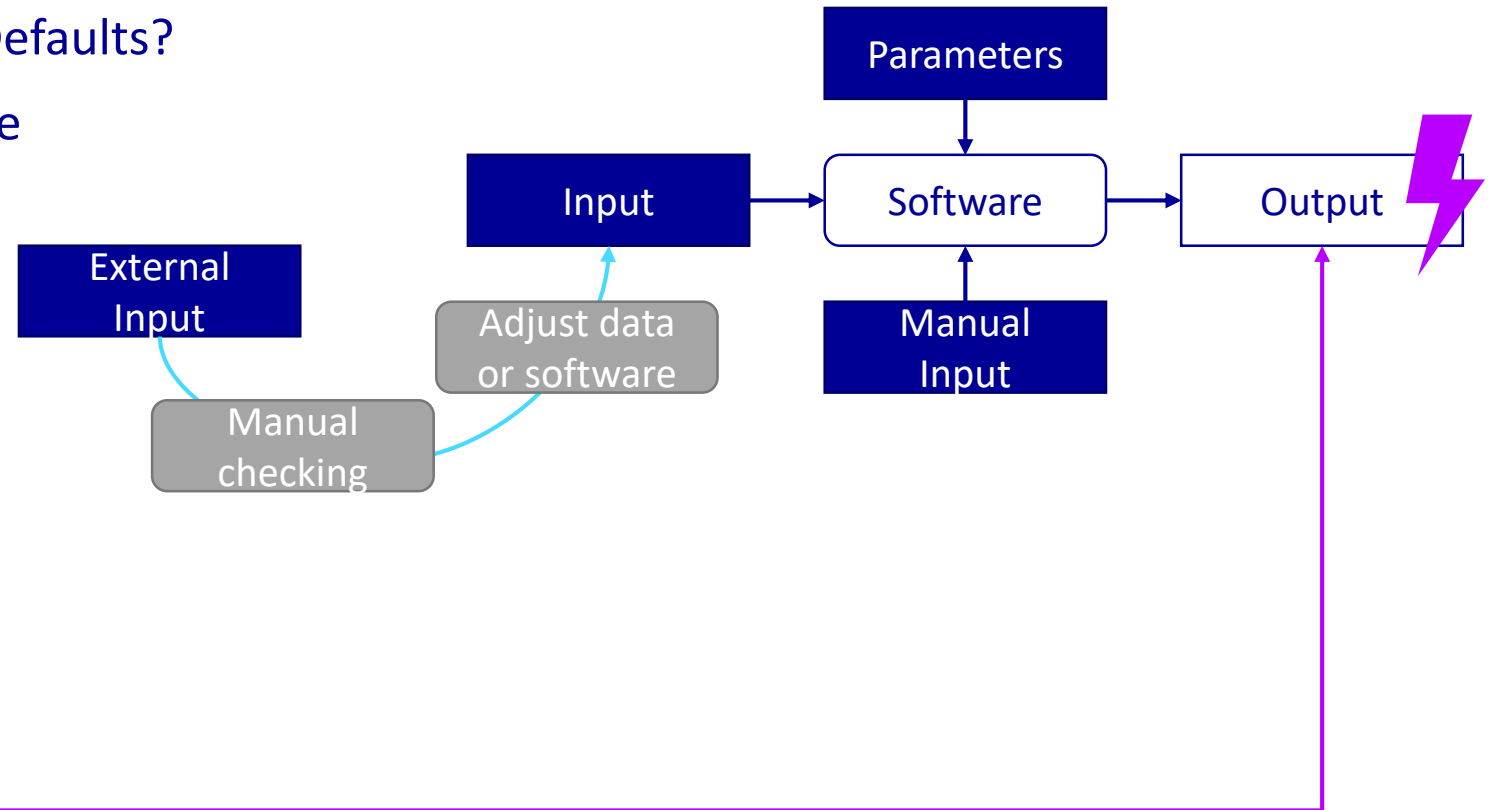
- Compare or replace software, models, etc.



02 | Challenges for research software

Challenges for research software

- Written by experts
 - Parameters – expose or not? Defaults?
 - Manual input – try to automate
- A different dataset?
 - „I have to check it first“
 - Half-automated scripts
- It works on my machine
 - Happy Path
 - „All I know is: it crashed“



03 | What is OSTAR?

What is OSTAR?



Simulate Sensors



Combine ADAS, e.g. Eclipse ADORe

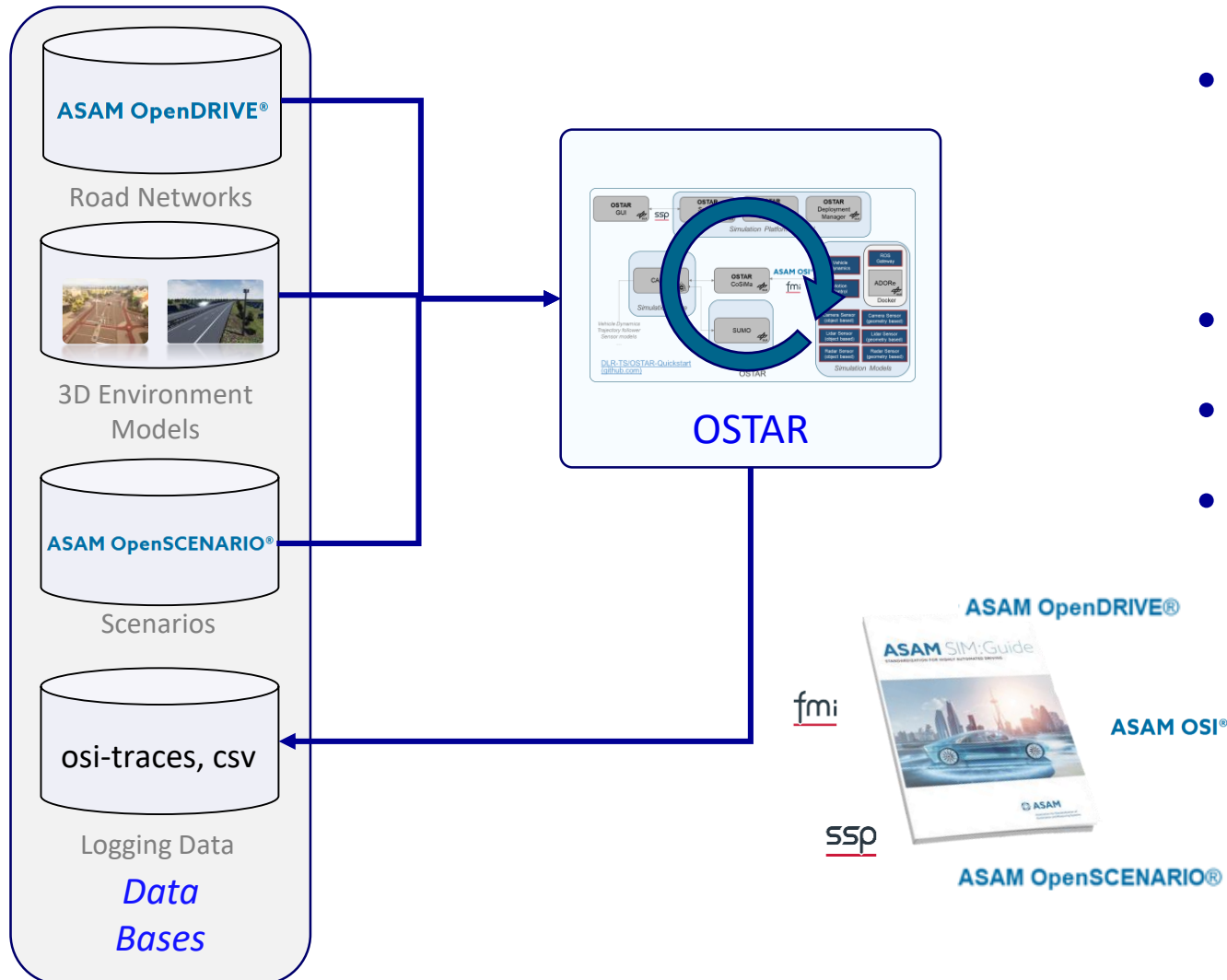


Simulate Sensor View of Infrastructure



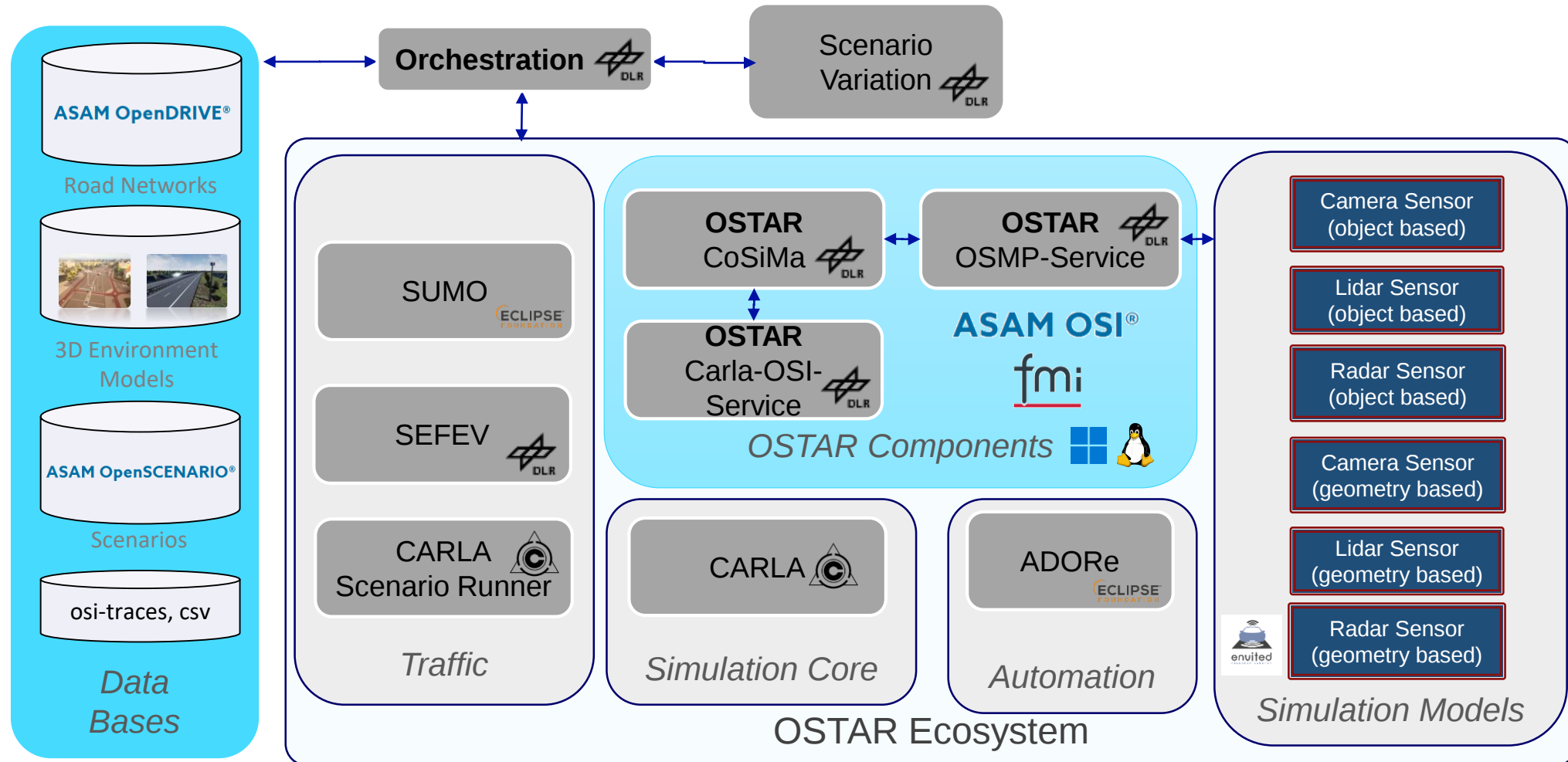
Upgrade to Unreal Engine 5 with **GEMSTAR**

What is OSTAR?



- Combine Carla simulations with Sensor FMUs
 - to create virtual sensor data
- Open Source and modular
- Automated Execution
- Standards
 - OpenDRIVE
 - OpenSCENARIO
 - FMI
 - OSI

What is OSTAR?



04 | How to setup OSTAR

How to setup OSTAR?

Single Container

```
git clone https://github.com/DLR-
TS/OSTAR-Quickstart.git
cd OSTAR-Quickstart
chmod +x *.sh
./setup.sh -docker
./run.sh --visual
```

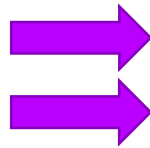
10 different scenario setups

```
sim@mmup122:~/OSTAR/OSTAR-Quickstart$ ./run.sh --visual
Choose a directory or add it as a runtime parameter:
1) scenarios/01-opendrive-openscenario/
2) scenarios/02-town10hd-replay-trajectories/
3) scenarios/03-town10hd-replay-trajectories-with-sensor/
4) scenarios/04-osmp-openloop-without-carla/
5) scenarios/05-osmp-proxy/
6) scenarios/06-static-sensor/
7) scenarios/07-geometrical-sensor-model/
8) scenarios/08-sumo/
9) scenarios/09-distributed/
10) scenarios/10-mapimport/
#?
```

How to setup OSTAR?

Own simulation setup with a directory containing:

- .yaml (mandatory CoSiMa configuration)
- .fmu (optional FMU models)
- .xodr (optional OpenDRIVE)
- .xosc (optional OpenSCENARIO)
- .tar.gz (optional UE 3D map)
- .csv (optional Replay file)
- .sumoconf etc. (optional SUMO configuration)
- distributed.txt (optional marks a distributed simulation for run.sh)



```
sim@mmup122:~/OSTAR/OSTAR-Quickstart$ ./run.sh --visual
Choose a directory or add it as a runtime parameter:
1) scenarios/01-opendrive-openscenario/
2) scenarios/02-town10hd-replay-trajectories/
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5) scenarios/05-osmp-proxy/
6) scenarios/06-static-sensor/
7) scenarios/07-geometrical-sensor-model/
8) scenarios/08-sumo/
9) scenarios/09-distributed/
10) scenarios/10-mapimport/
11) scenarios/11-myOwnScenario/
#? ^C
sim@mmup122:~/OSTAR/OSTAR-Quickstart$ ./run.sh scenarios/11-myOwnScenario/
Scenario path: scenarios/11-myOwnScenario/
```

05 | The future of OSTAR

The future of OSTAR?

OSTAR becomes GEMSTAR

- Replace Carla Simulator with own Unreal Engine 5 implementation
- More time independence
- More Synergies inside DLR with UE5
- Specialized on OD-ODD matching
- OSTAR will remain available Open Source at Github and Dockerhub



gaia-x PLC-AAD

Is part of the family of projects gaia-x  future mobility

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Gaia-X 4 Future Mobility
Coordinated by the DLR Institute
for AI Safety and Security

