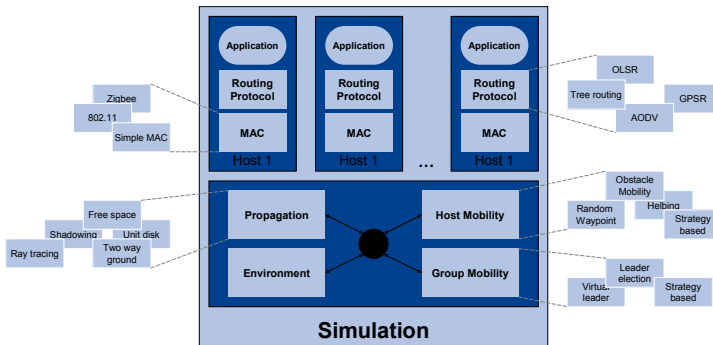


Towards Flexible and Modular Simulation Models

Layered Module Concatenation



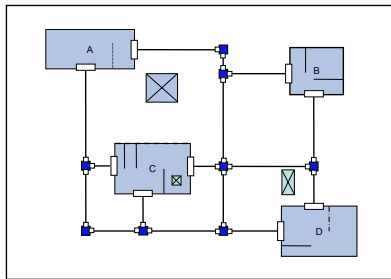
Highly Flexible Simulation

- Concatenate simulation modules based on your
 - accuracy,
 - scalability, and
 - granularity needs
- Modeling of realistic scenarios
- Set of independent modules
 - Environment
 - Propagation
 - Mobility
 - Network stack
 - Application

Environment

Abstract map of the surroundings

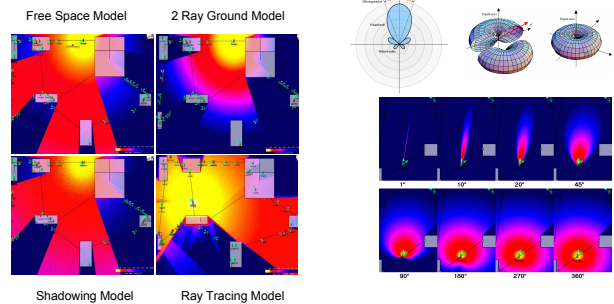
1. Obstacles (buildings, walls, hills) and paths
2. Provision of interfaces for other modules



```
<Area> // Gebäude
<AreaID>0</AreaID>
<AreaType>1</AreaType>
<Leftup>
  <x>500</x>
  <y>50</y>
</Leftup>
<Rightdown>
  <x>750</x>
  <y>200</y>
</Rightdown>
<Wall>
  ...
</Wall>
</Area>
```

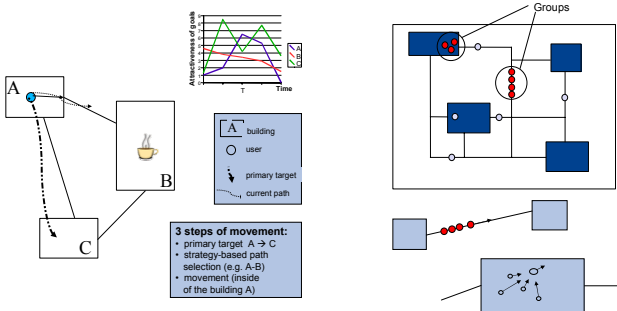
Propagation

- Modeling of signals considering material properties of walls
- Model of beam antennas for communication devices
- Free Space, 2-Ray-Ground, Shadowing, Ray tracing, ...



Mobility Models

- Strategy-based, goal-oriented single user mobility
- Dynamic group mobility model based on human social aspects and individual mobility of users



Conclusions

- Modular framework for the evaluation of mobile applications
- Investigation of realistic scenarios

