



Airborne surveillance - Future automation trends

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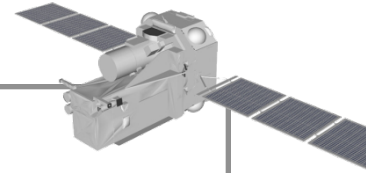




Different kinds of airborne surveillance



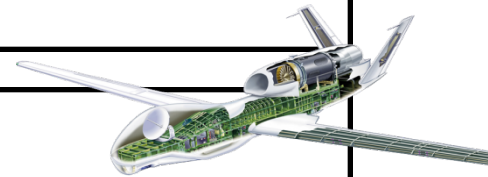
(Satellite)

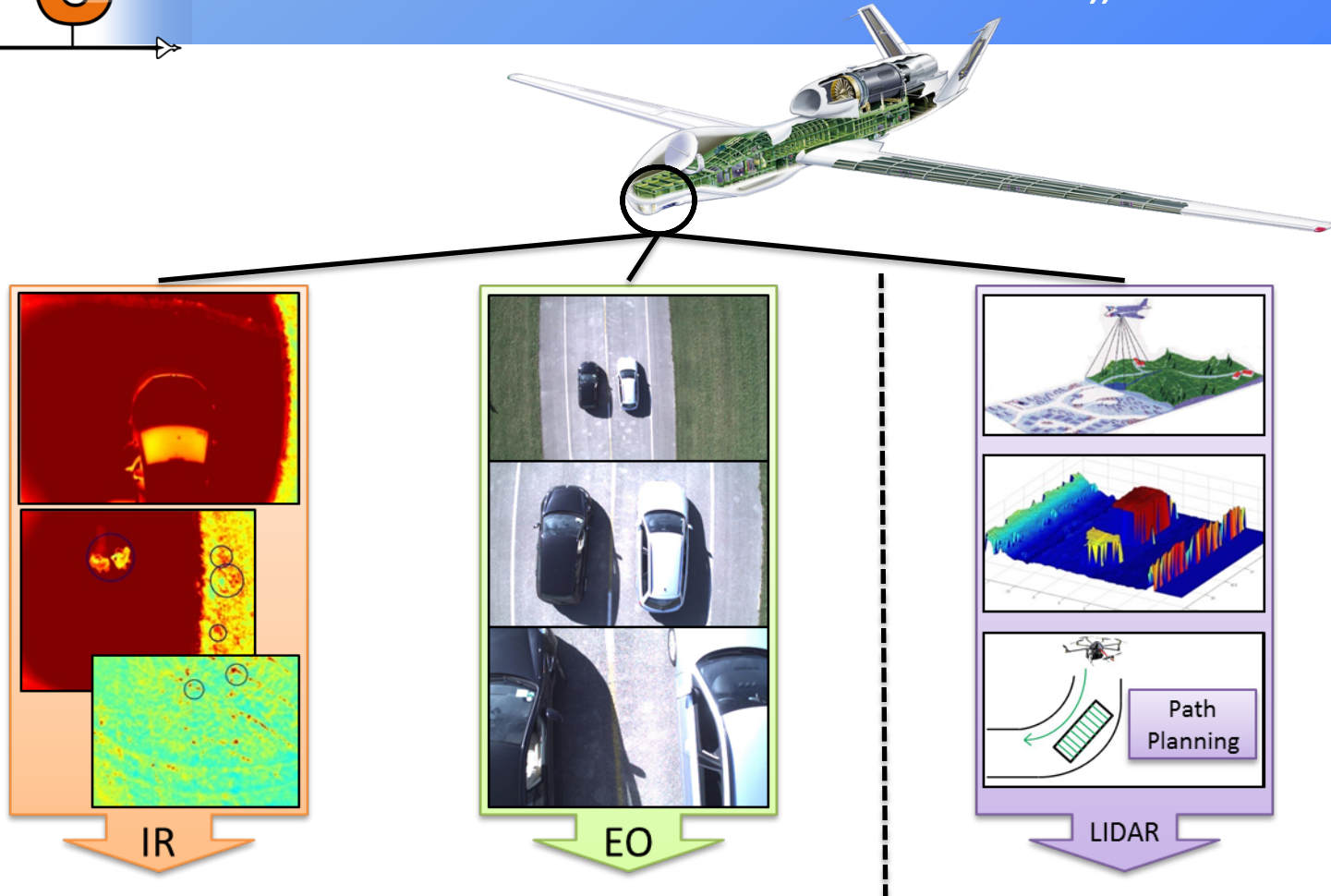


Manned Aircraft



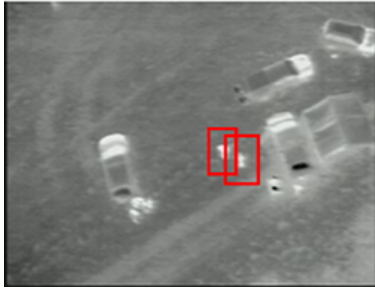
UAVs



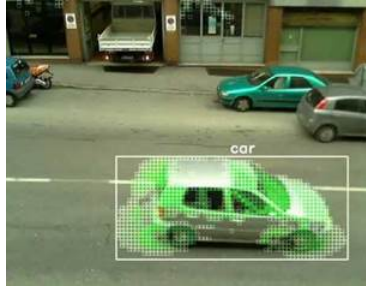




Common Tasks



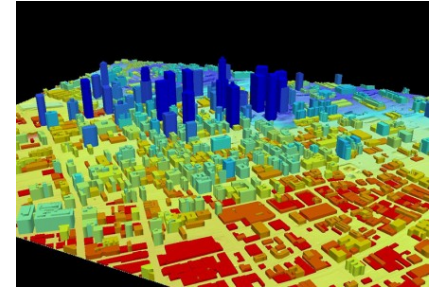
Person detection



Vehicle detection



Aerial reconnaissance



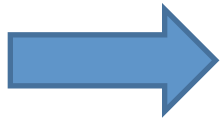
3D LIDAR scan



Tracking



3D landscape reconstruction & texturing



Different Tasks under varying circumstances during flight

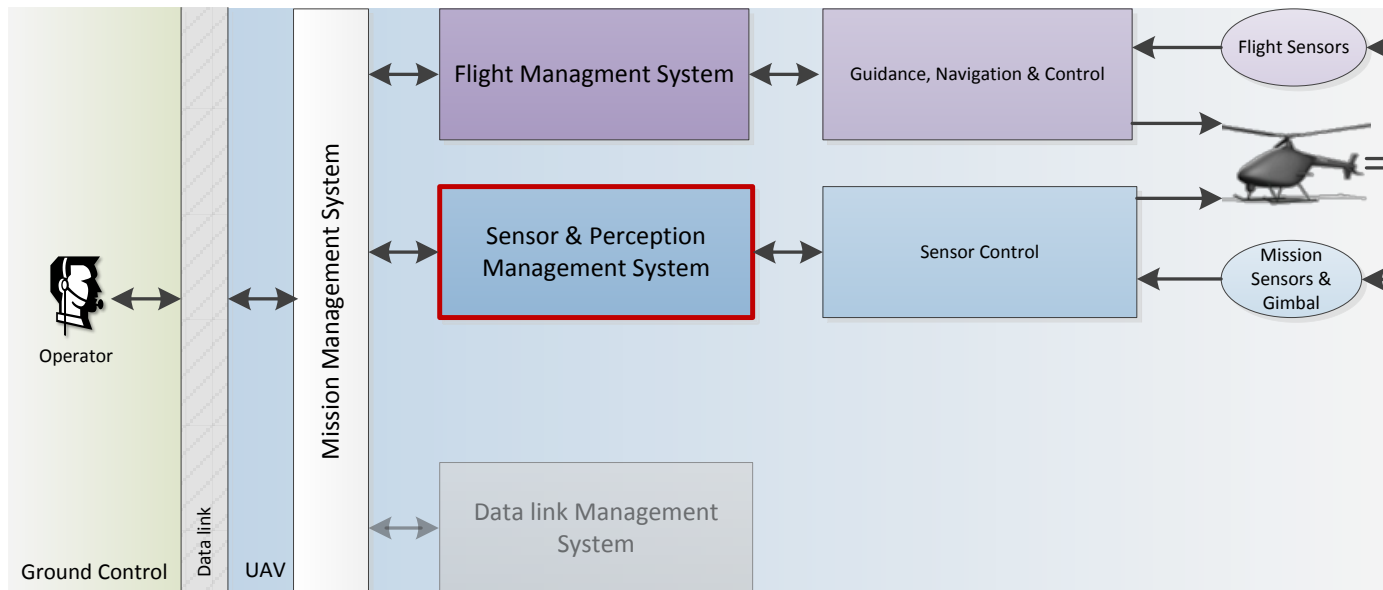
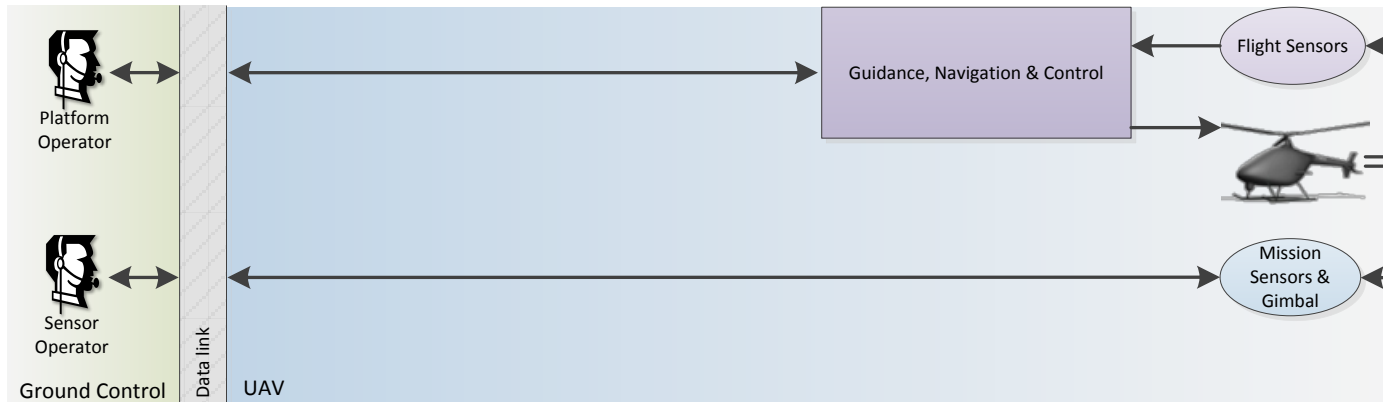


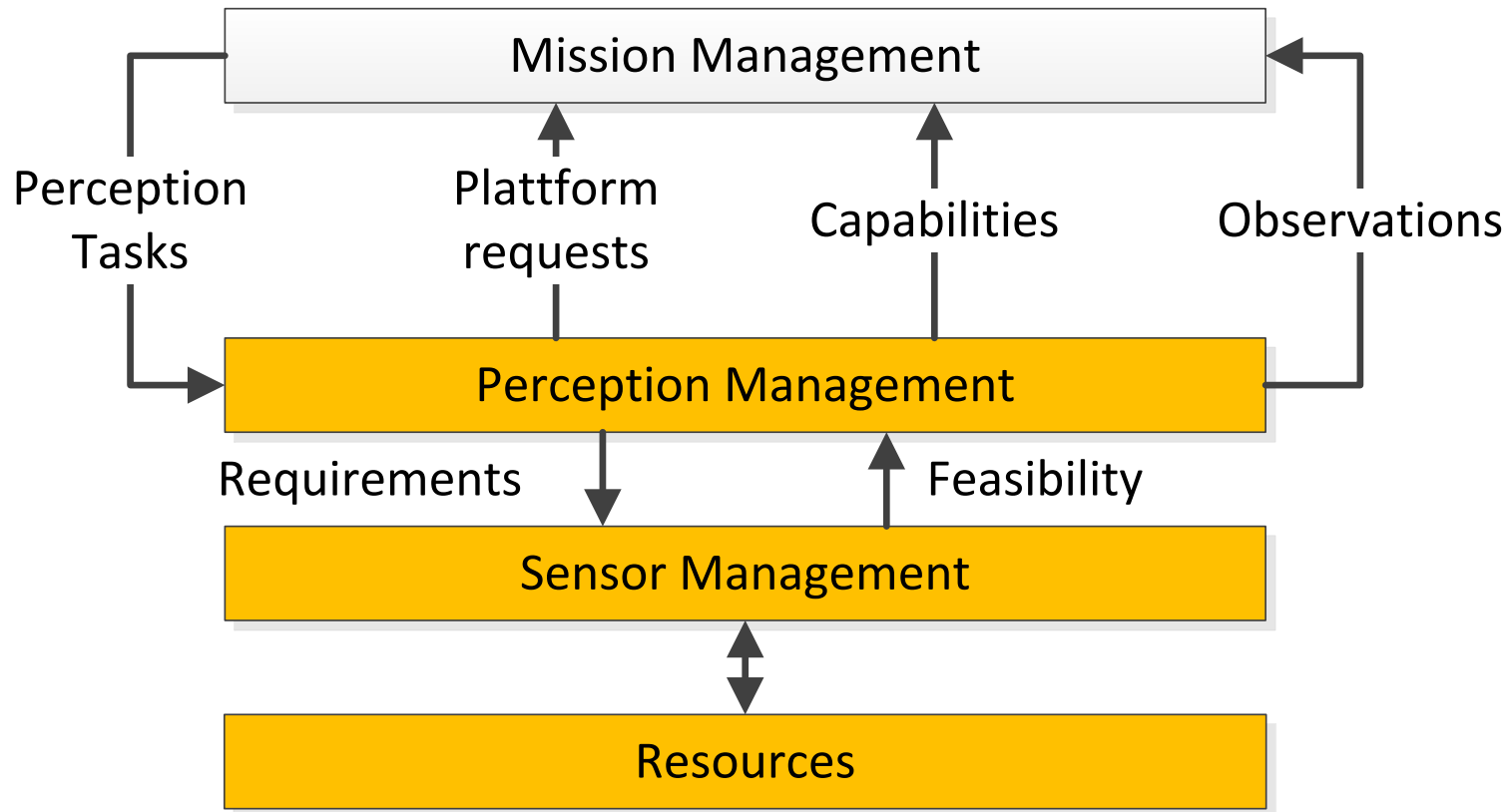
Need for automated sensor configuration and data content processing



- Which Sensor/Algorithm configuration shall be used for dedicated task?
- What is the influence of atmospheric/weather & time-of-day/seasonal conditions?
 - Lighting
 - Clouds
 - rain
- What is the influence of the setting (Ground coverage, Infrastructure,..) ?
 - Urban
 - Trees
 - Grassland
 - asphalt

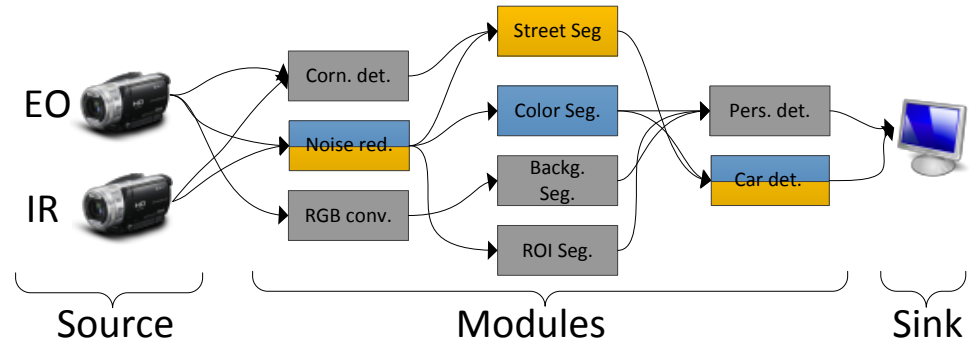
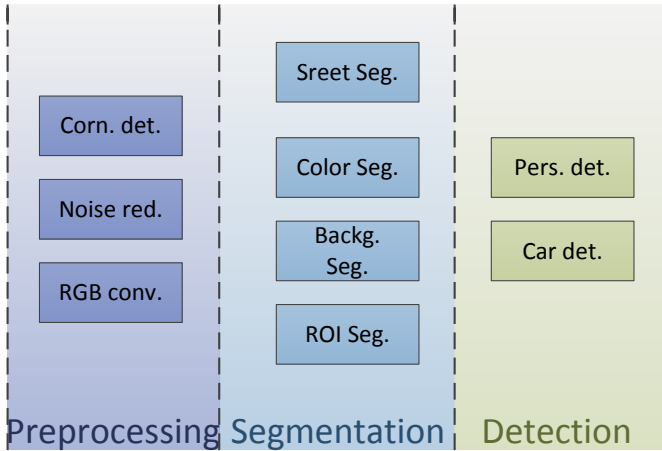
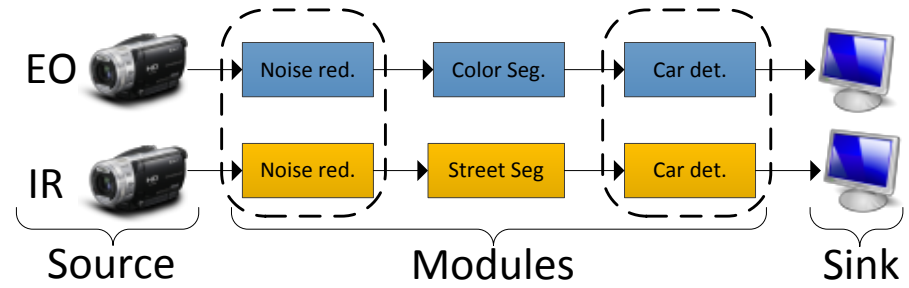
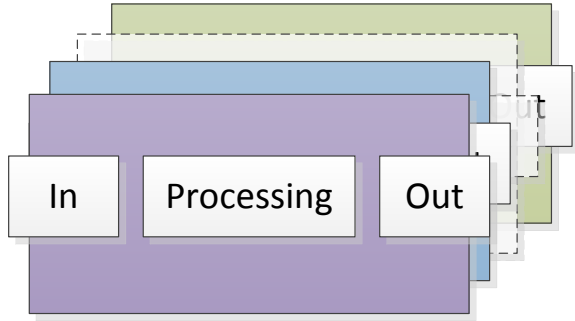


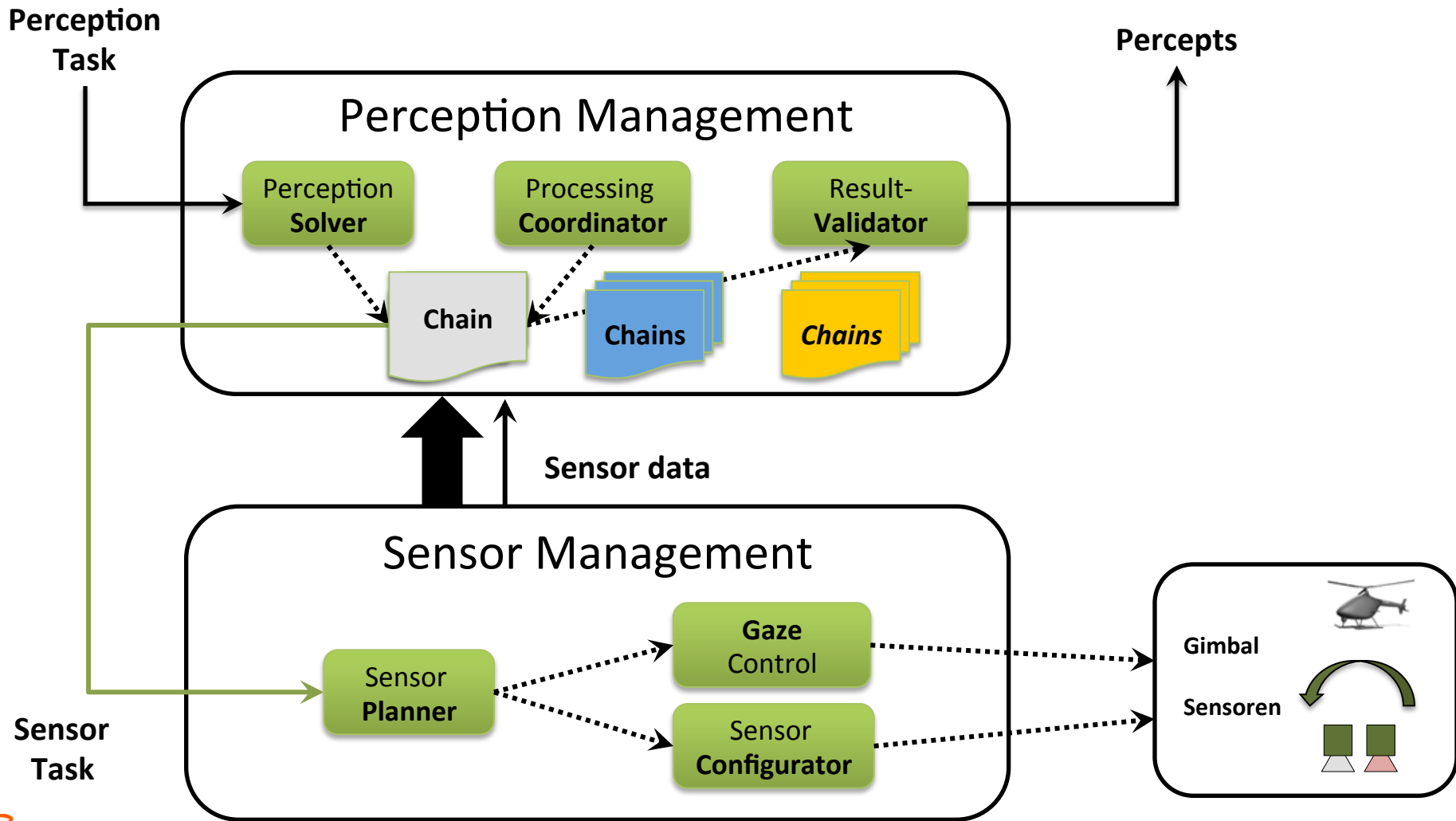






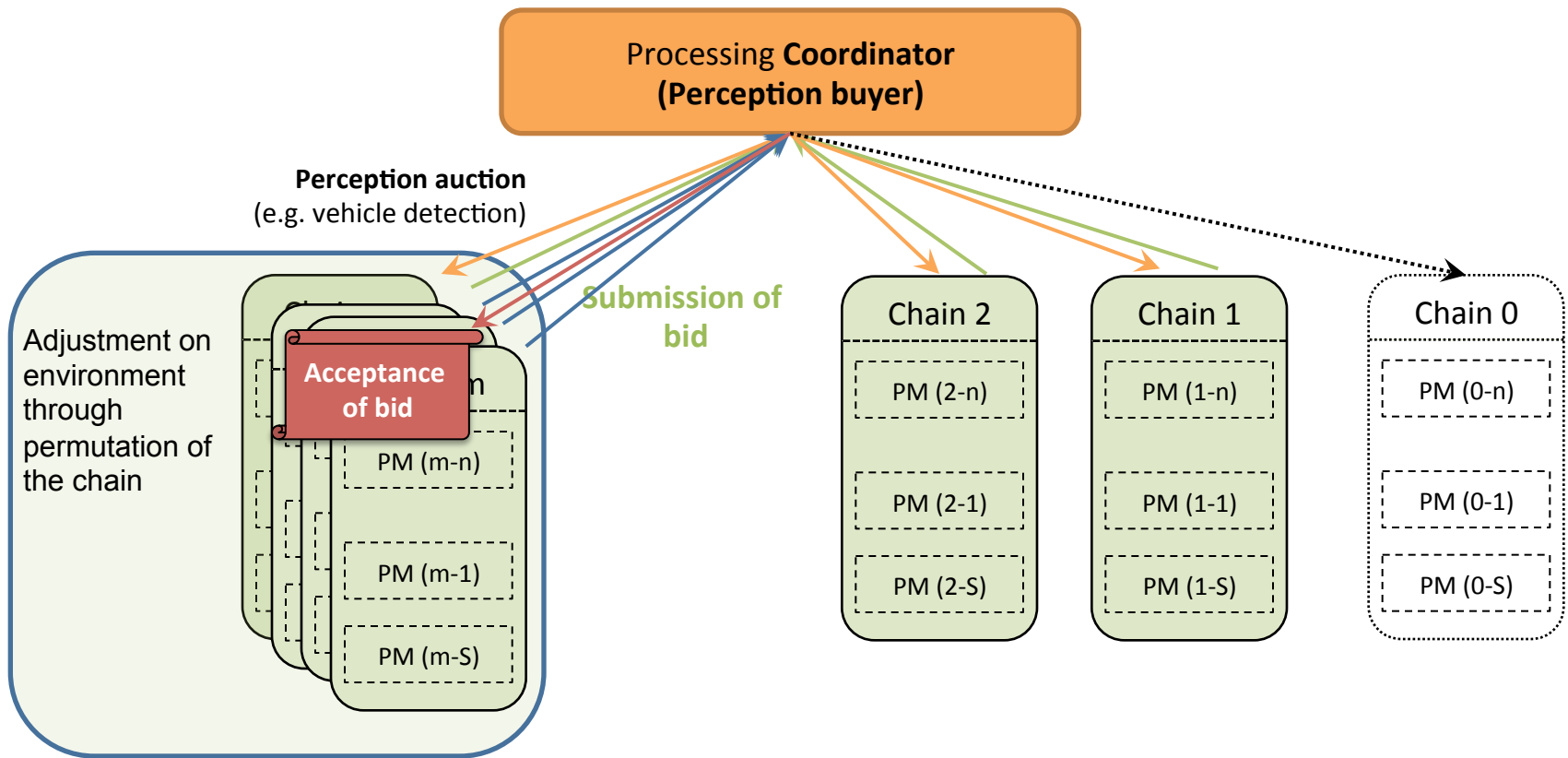
Perceptiongraph, -chain and -modules



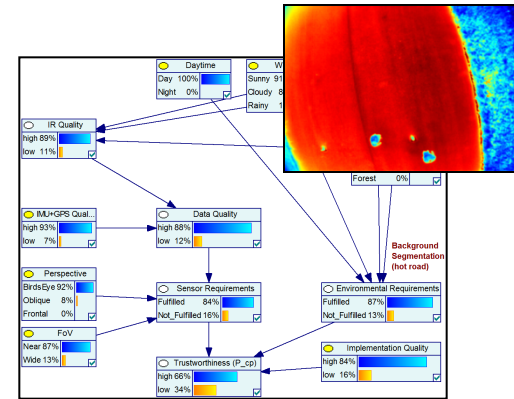
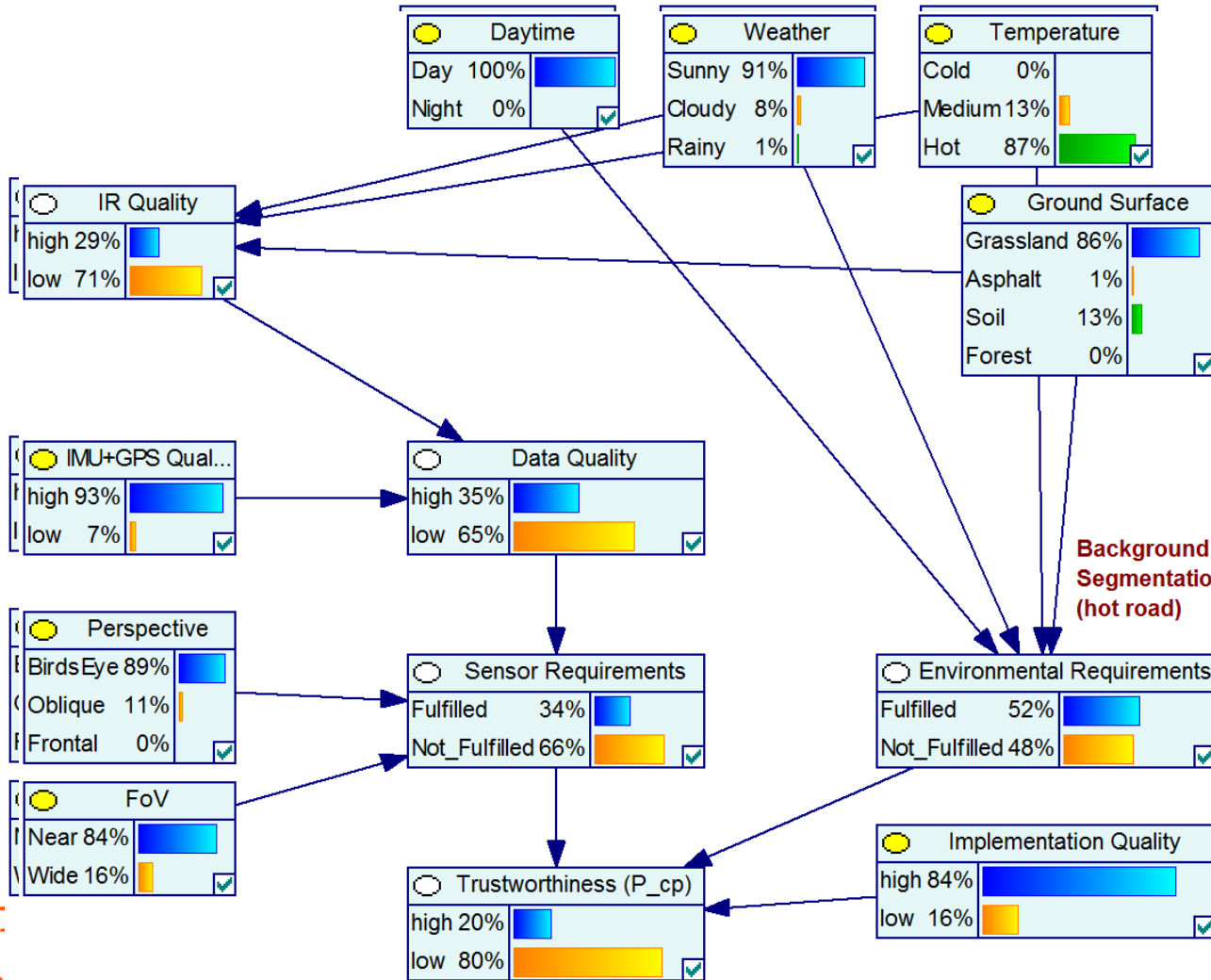


Choosing Criteria

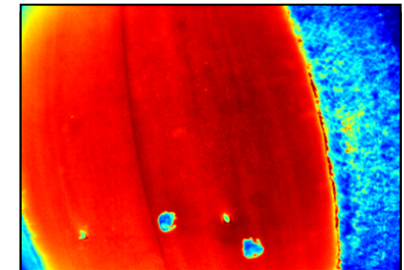
- Quality (expected robustness)
- Price (ressources)
- Experience (trustiness)



Example „Persondetection with IR on street



Background Segmentation (hot road)





- Knowledge elicitation and representation of perceptual capabilities
- Create description method for modules (including capabilities, limitations, requirements) based on semantic webtechnologies
- Automated training and testing of modules /module descriptions
- Adapting existing perception chains by using AI methods to extend perceptual capabilities

