

Ensemble of experts for robust floor-obstacle segmentation of omnidirectional images for mobile robot visual navigation

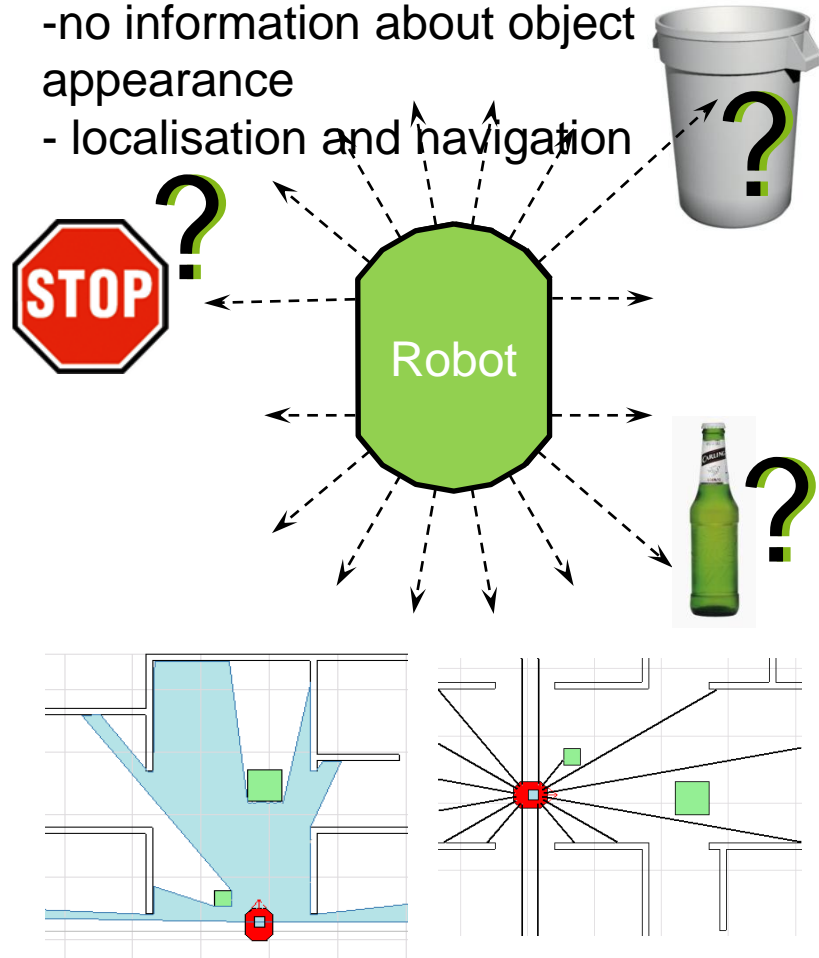
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Motivation

Traditional Range

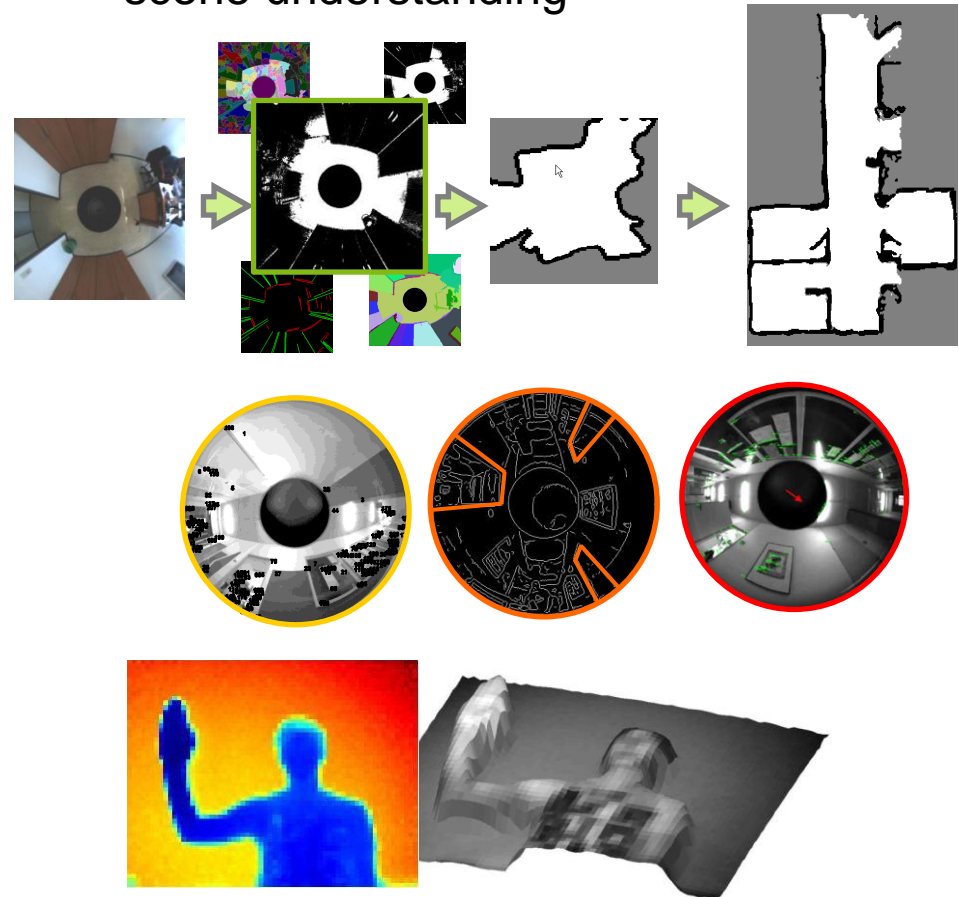
Sensors

- compact depth information
- no information about object appearance
- localisation and navigation

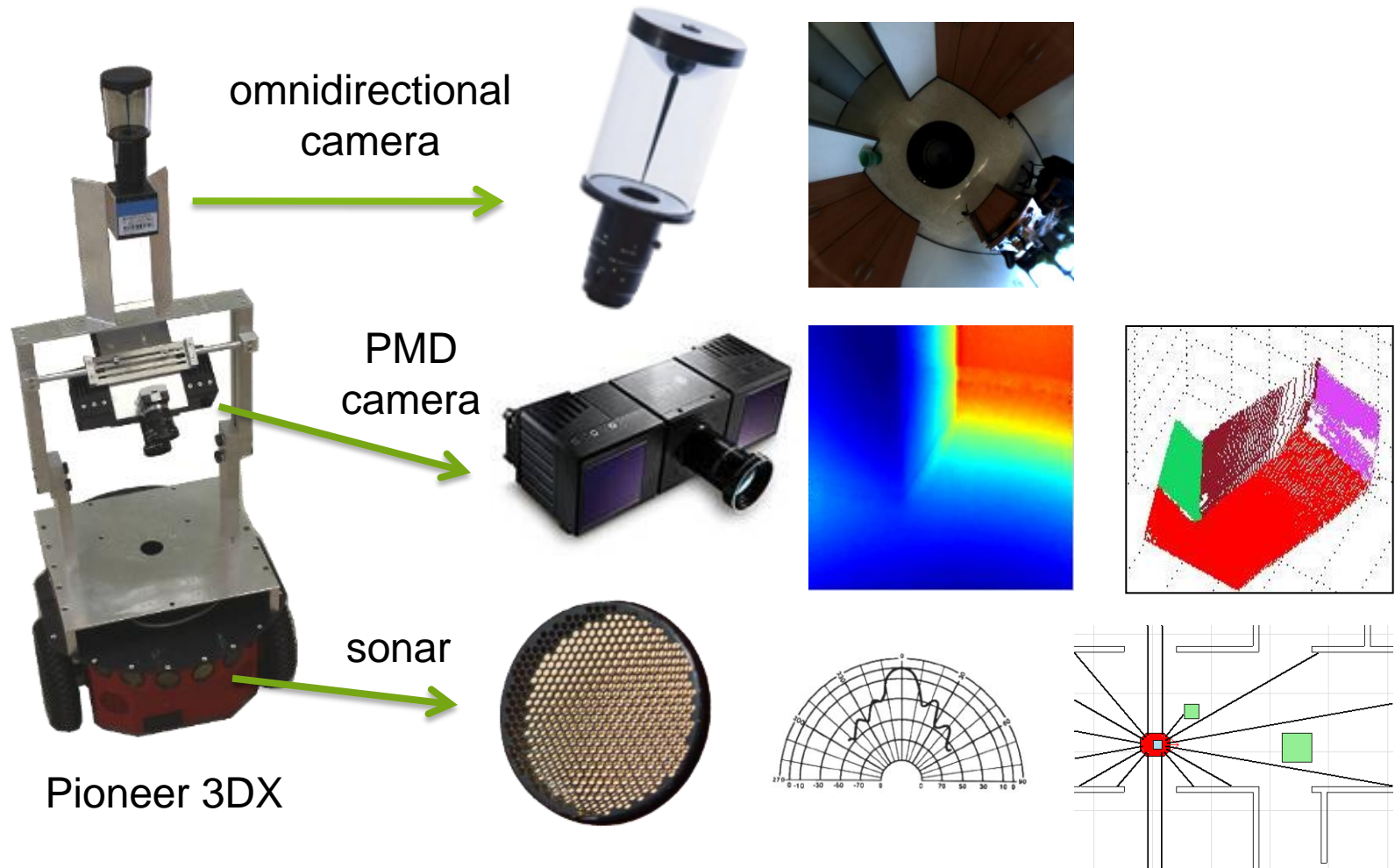


Vision

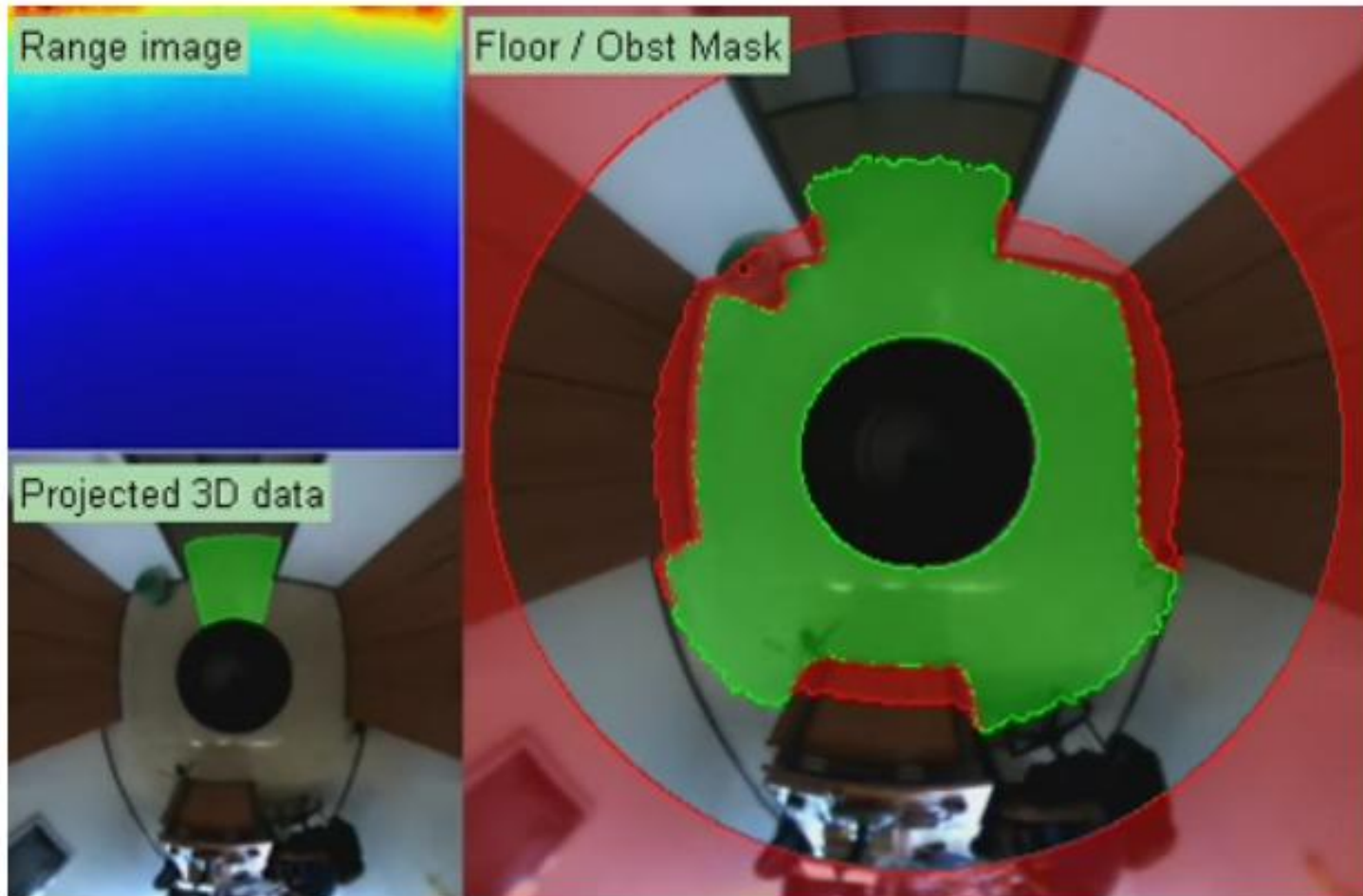
- more complex information
- no immediate depth
- scene understanding



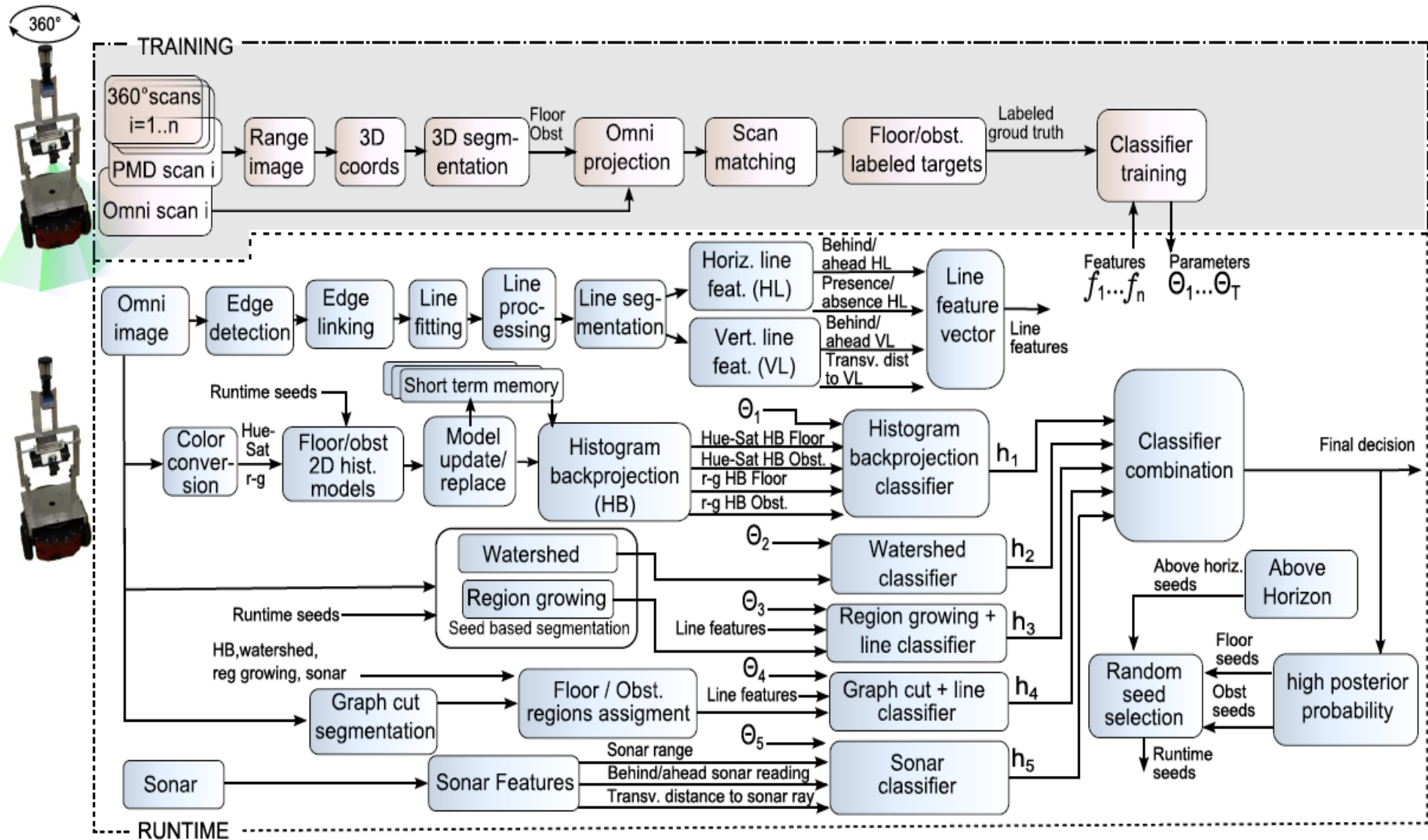
Mobile Platform and Sensors



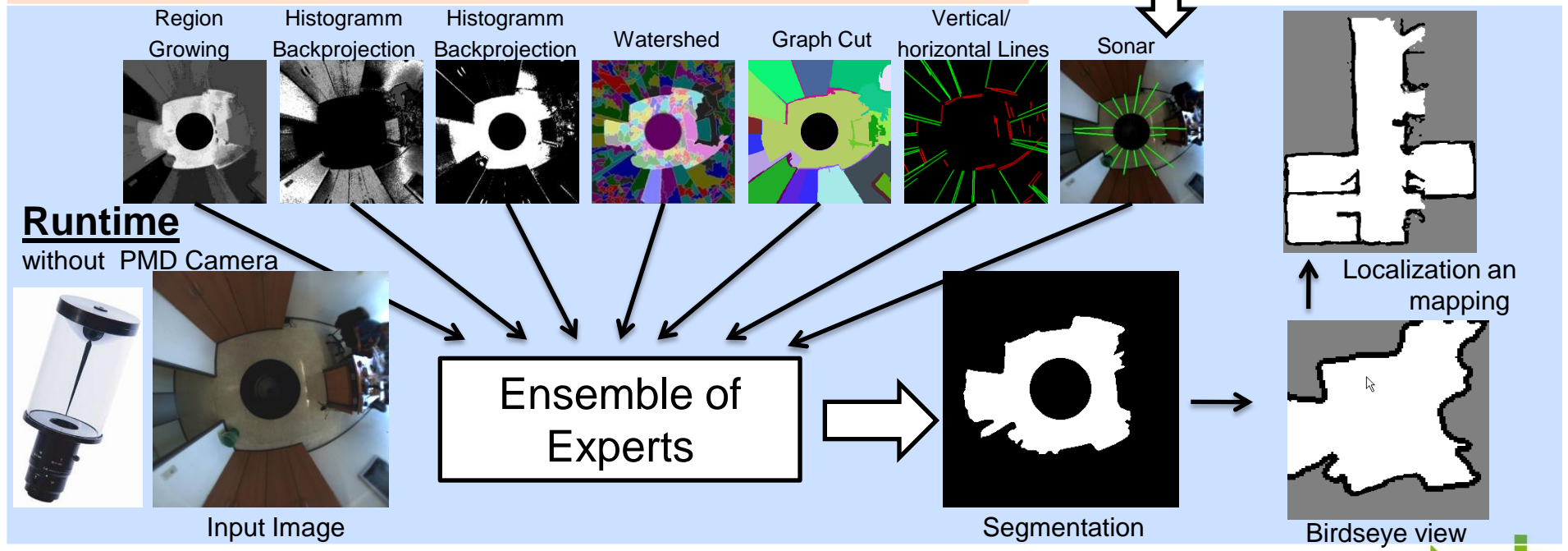
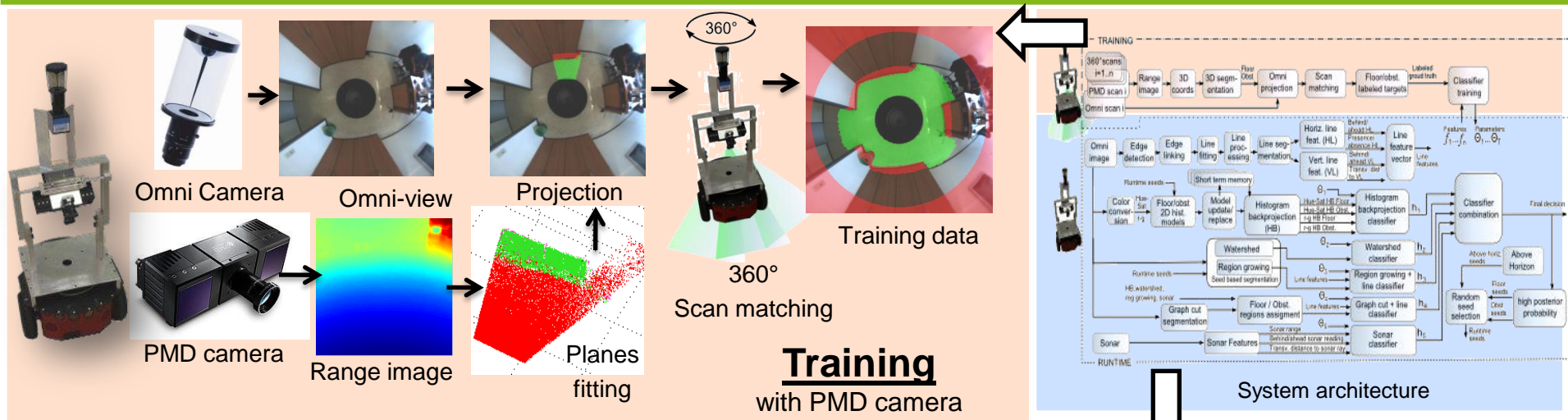
Training of the Classifiers



Unsupervised Floor Segmentation



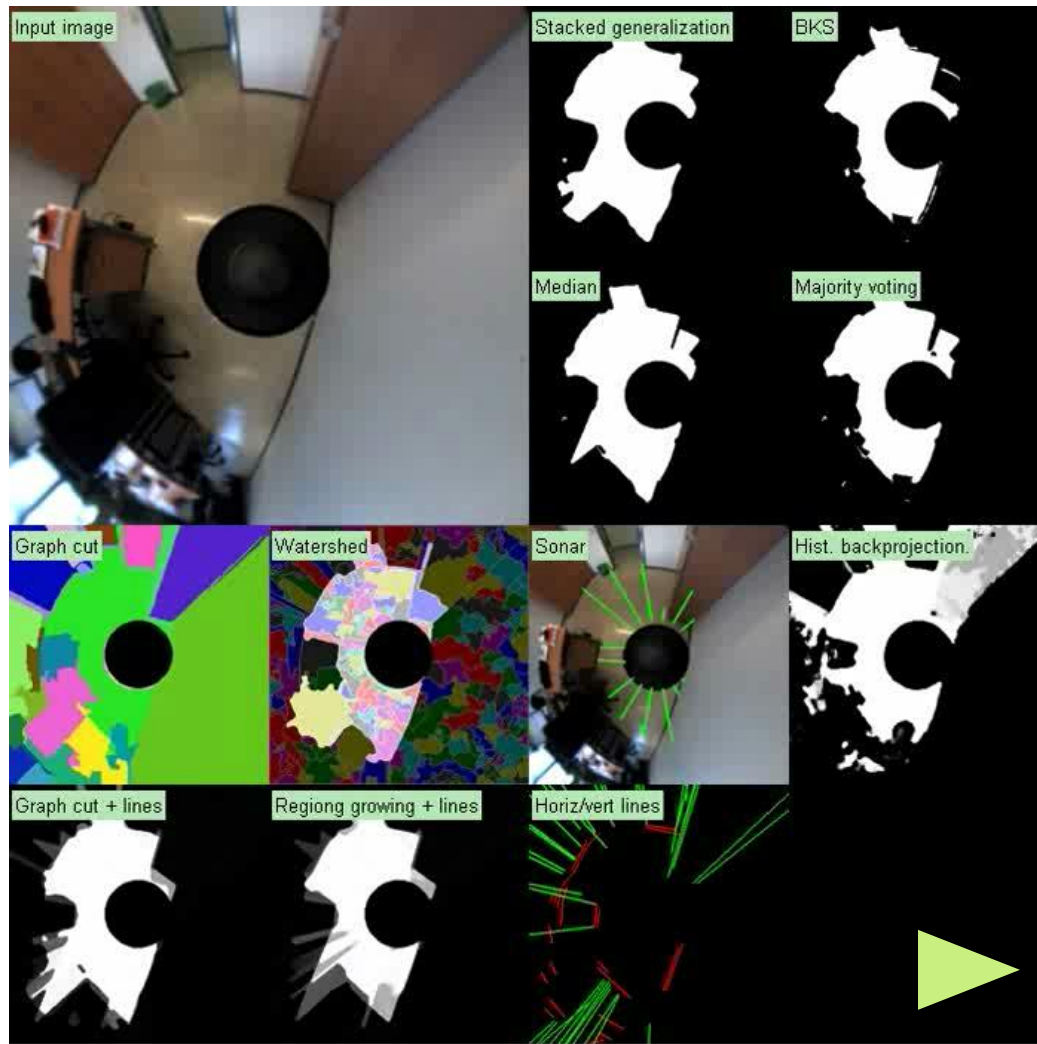
Unsupervised Floor Segmentation

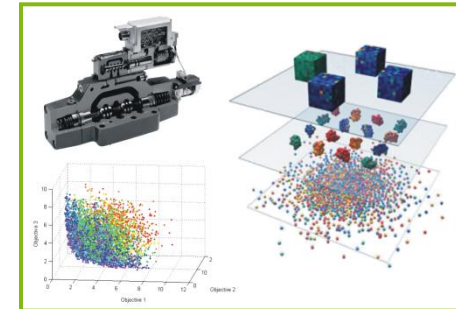
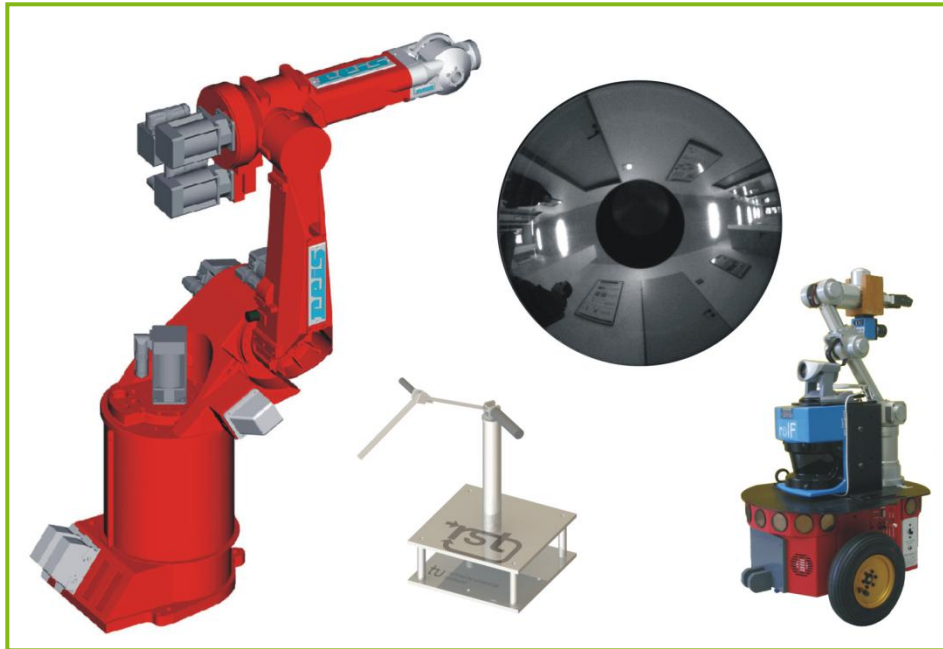


Ensemble of Experts Classifier Performance

Method	<i>FPR</i>	<i>TPR</i>
Histogram backprojection	0.085	0.889
Watershed	0.042	0.945
Watershed + line features	0.036	0.938
Region growing	0.120	0.718
Region growing + line features	0.044	0.907
Graph cut	0.064	0.869
Graph cut + line features	0.023	0.917
Sonar	0.045	0.890
Combination with stacked generalization	0.032	0.958
Combination with BKS	0.030	0.912
Combination with median	0.024	0.945
Combination with majority voting	0.024	0.927

Segmentation with Ensemble of Experts





Thank you for your kind attention!