Visual Localization & Preaggregation

MOTIVATION

Visual features like line markings and poles provide valuable information for vehicle localization. Besides, they can be represented in a very compact way allowing to generate maps suitable for highly automated driving.

LOCALIZATION

For vehicle localization the information from the localization map (lane markings, poles, etc.) is projected into the camera image. Simultaneously, those visual features are detected in the image. By taking the deviation between these measurements and the projected map into account, the vehicle position can be estimated.
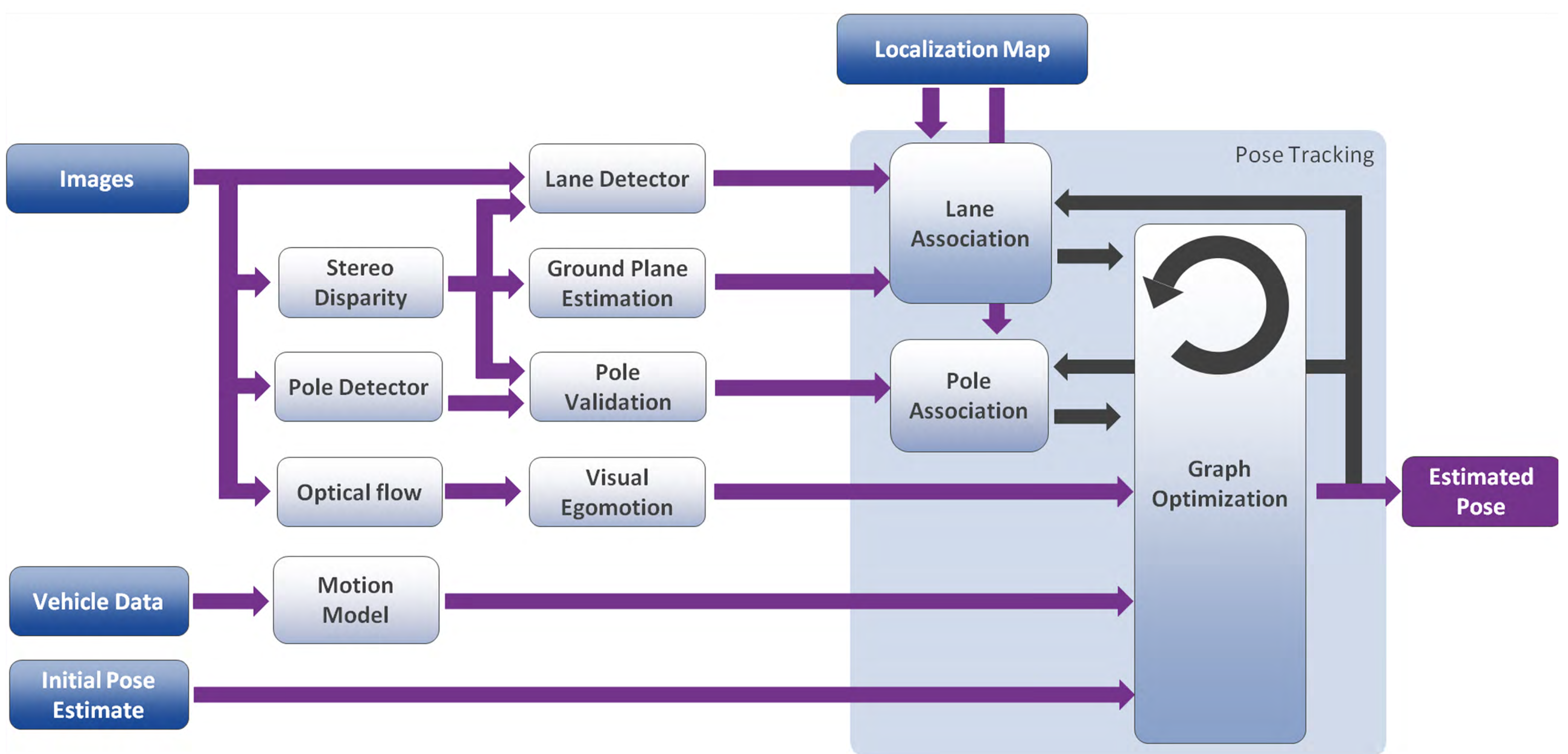

Figure 1: data flow of the localization pipeline

Figure 2: localization map projected into the images

PRE-AGGREGATION

During pre-aggregation, submaps of the local surroundings are generated by accumulating multiple detections of the camera sensor. Together with the current GPS position those submaps are uploaded to the backend server where they are merged into a globally consistent and up-to-date map, that is used for vehicle localization.

Figure 3: generation of submaps during pre-aggregation

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