Perception Outputs

This section provides a description of the perception software outputs which are provided by the Innoviz API Driver.

Not all structures are provided here. More information can be found in the VB.hpp driver file within the common_includes folder of the API Driver software.

The main structures are:

1. struct ObjectPodLidar
2. struct DetectionLidar

1. The interface is limited to maximum of 100 ObjectPodLidar structs per frame (an array size 100).
2. The maximum number of DetectionLidar structs per frame is 238301 (an array size 238301).

1.1. ObjectPodLidar struct

The ObjectPodLidar struct defines data for a single object detection.

Type	Field Name	Description
struct ObjectSummary	summary	A structure which includes the object's id, age, measurement status, and movement status.
struct ObjectExistence	existence	A structure which includes the object's existence probability and existence Positive Predictive Value.
struct SensorStatusFlags	statusSensors	Not in use
ObjectPosition3d	position	A structure which includes the object's position information including: 1. The reference point on the object model which defines the position of the object. 2. Position of the reference point along the x-axis in a Cartesian coordinate system [m]. 3. Standard deviation of the position of the reference point along the x-axis in a Cartesian coordinate system [m]. 4. Position of the reference point along the y-axis in a Cartesian coordinate system [m]. 5. Standard deviation of the position of the reference point along the y-axis in a Cartesian coordinate system [m]. 6. Position of the reference point along the z-axis in a Cartesian coordinate system [m]. 7. Standard deviation of the position of the reference point along the z-axis in a Cartesian coordinate system [m]. 8. Covariance between estimation of the x and y position [m^2].

Type	Field Name	Description
		9. Orientation of the object bounding box in the ego-vehicle coordinate system [rad]. 10. Standard deviation of orientation of the object bounding box in the ego-vehicle coordinate system [rad].
ObjectDynamics	dynamics	A structure which includes the object's dynamics information including: 1. Absolute velocity of an object [m/s]. 2. Relative velocity of an object [m/s]. 3. Absolute acceleration of an object [m/s^2]. 4. Relative acceleration of an object [m/s^2]. 5. Orientation rate of the object [rad/s].
ShapeBoundingBox3d	shape3d	The object's bounding box length, width and height [m].
ObjectClassification	classification	Object's classification class [0,100]. Percentage that the object is of each class type out of the possible classes: Car, Truck, Motorcycle, Bicycle Pedestrian, and Unknown. All additional classes are not in use.
ObjectLights	lights	Not in use

1.2. **DetectionLidar struct**

The DetectionLidar struct defines the Point Cloud Plus detection data.

Type	Field Name	Description
struct EmCentimeter	distance	The distance in [cm] from origin to detection.
struct EmPercent	positivePredictiveValue	The existence probability in the range [0, 100] of the detection given as Positive Predictive Value.
uint8_t	reflectivity	The estimated reflectivity [0-255].
uint8_t	classification	Pixel-level classification information out of the possible classes: No Classification (general obstacle), Noise, Ground, Invalid, Under-drivable, Car, Truck, Motorcycle, Bicycle, Pedestrian, and Unknown. All additional classes are not in use.
struct EmPercent	confidence	The estimated confidence is a measure on how likely there is a detection at the given location.

Type	Field Name	Description
int16_t	angleAzimuth	The angle between the x-axis and projection of the unit vector on the x-y plane.
int16_t	angleElevation	The angle between the x-axis and projection of the unit vector on the x-z plane.