LIST OF SYMBOLS

x_t, y_t	Robot position coordinates at time t
θ_t	Robot orientation at time t
v	Linear velocity of the robot
ω	Angular velocity of the robot
Δt	Time step
r, θ	Polar coordinates from LiDAR (distance and angle)
x_{lidar}, y_{lidar}	LiDAR sensor Cartesian coordinates
x_{global}, y_{global}	Global coordinates in the map frame
$P(object)$	Probability that an object exists in the bounding box
IOU	Intersection Over Union (metric for bounding box accuracy)
$\mathcal{L}_{box}$	Localization error (bounding box loss)
$\mathcal{L}_{obj}$	Object confidence loss
$\mathcal{L}_{noobj}$	No-object confidence loss
$\mathcal{L}_{class}$	Classification loss
$\mathbf{H}$	Parity check matrix
I	Original image
I'	Augmented image after transformations
$T(I)$	Transformation function applied to the image I
FOV	Field of View
Z_{min}, Z_{max}	Minimum and maximum depth range
D_{min}, D_{max}	Minimum and maximum detection range
R_{lidar}	LiDAR's detection radius
f_{camera}	Camera frame rate (frames per second)
f_{lidar}	LiDAR scan frequency (Hz)
v_{max}	Maximum allowable velocity
d_{min}	Minimum distance for accurate sensor data acquisition
W, H	Width and height of the object bounding box
X_{center}, Y_{center}	Center coordinates of the bounding box in the image frame