AMCL

⇒ Amcl is a probabilistic localization system for a robot moving in 2D.

⇒ It implements the adaptive (KLD-sampling) Monte Carlo localization approach

⇒ amcl takes in a laser-based map, laser scans, and transform messages, and outputs pose estimates.

⇒ On startup, amcl initializes its particle filter according to the parameters provided, if no parameters are set, the initial filter state will be a moderately sized particle cloud centered about (0,0,0).

★ Subscribed topic

scan ⟶ laser scan

tf ⟶ Transforms

map ⟶ When the use_map_topic Parameter is Set

initialpose ⟶ Mean and covariance with which to re-initialize the particle filter.

★ Published topics

amcl_pose ⟶ Robot's estimated pose in the map, with covariance.

particlecloud
↳ The set of pose estimates being maintained by the filter.

tf
↳ Publishes transform from odom to map.

★ Services

global_localization
↳ Initiate global localization, wherein all particles are dispersed randomly through the free space in the map.

request_nomotion_update
↳ Service to manually perform update and publish updated Particles.

set_map
↳ Service to manually set a new map and pose.

★ Service called

static_map
↳ amcl calls this service to retrieve the map that is used for laser based localization.