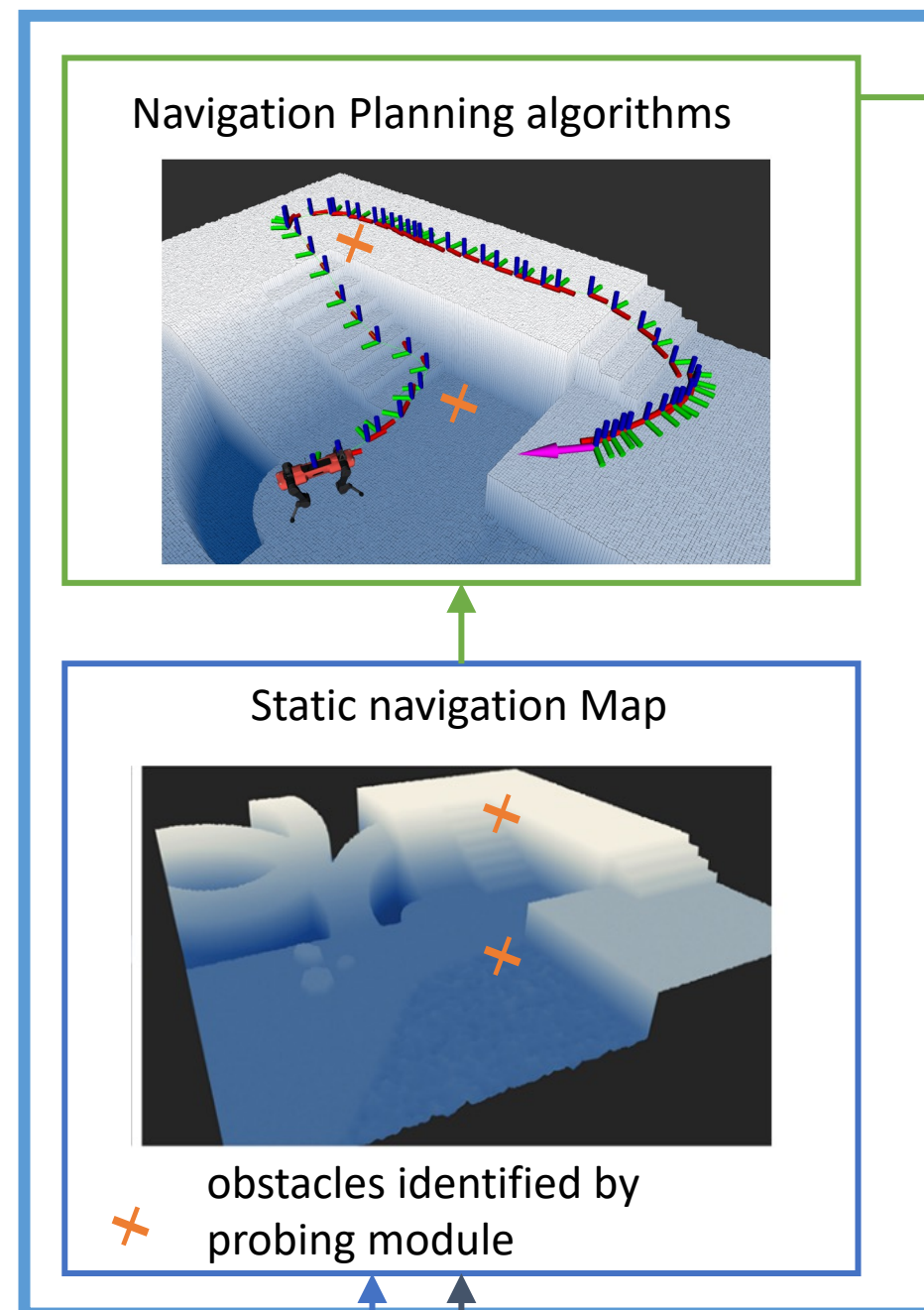


(2) Global navigation

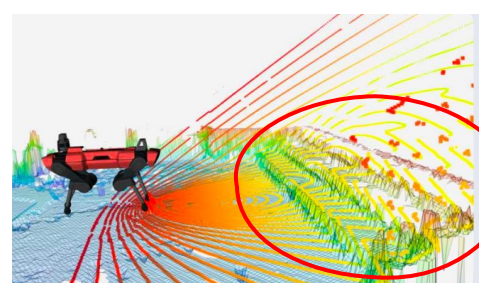


Command
Proprioception sequence

Noisy height scan

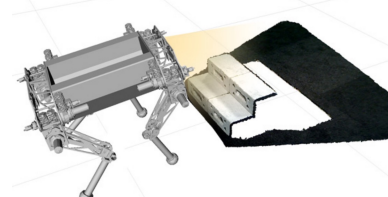


Ensemble noisy future scan



noisy Lidar info

noisy color camera



model rollout states

Add an obstacle "x" to the map and replan to generate a new command proprioception sequence

(1) Simulator

Domain randomization for different terrains and **dangerous obstacles**



✕ are randomized danger obstacles

(4) robust perceptive locomotion policy

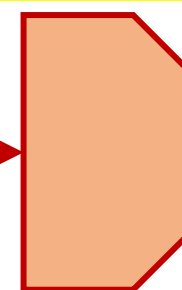
Pretrained
robust
controller

action



(3) Safe probing policy

Ensemble exteroceptive future encoder



Belief
encoder

hidden

MLP

near zero?

yes

confidence

rectification

decoder

Train for reconstruction

Privileged future states

Train with RL

Rewards