Informative Path Planning for Source Localization
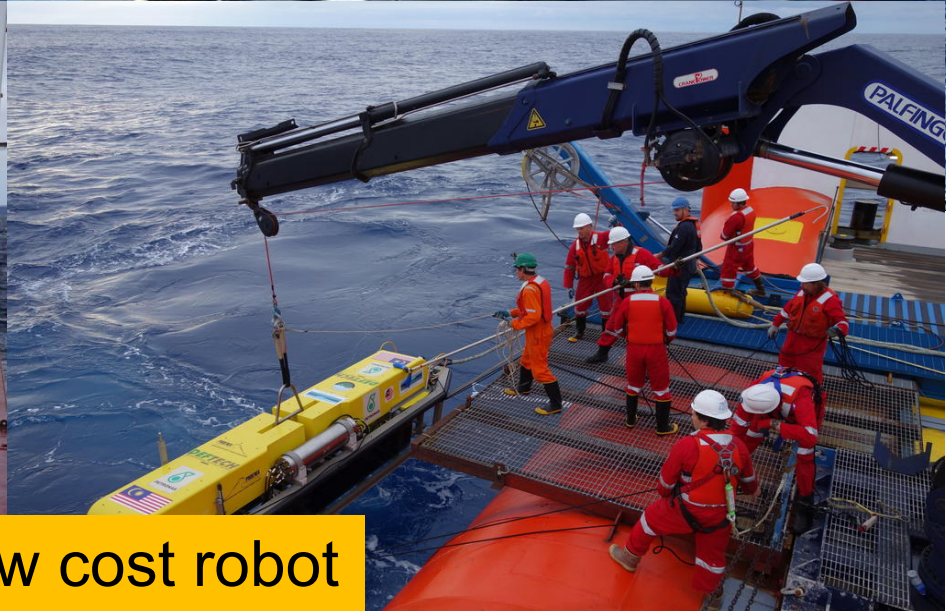
ICRA 2019 Workshop

Sound Source Localization and its Applications for Robots

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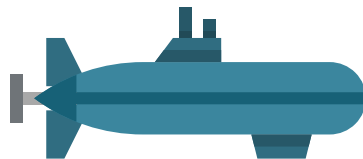
Acoustic Research Lab, Tropical Marine Science Institute, and Department

of Electrical and Computer Engineering , National University of Singapore
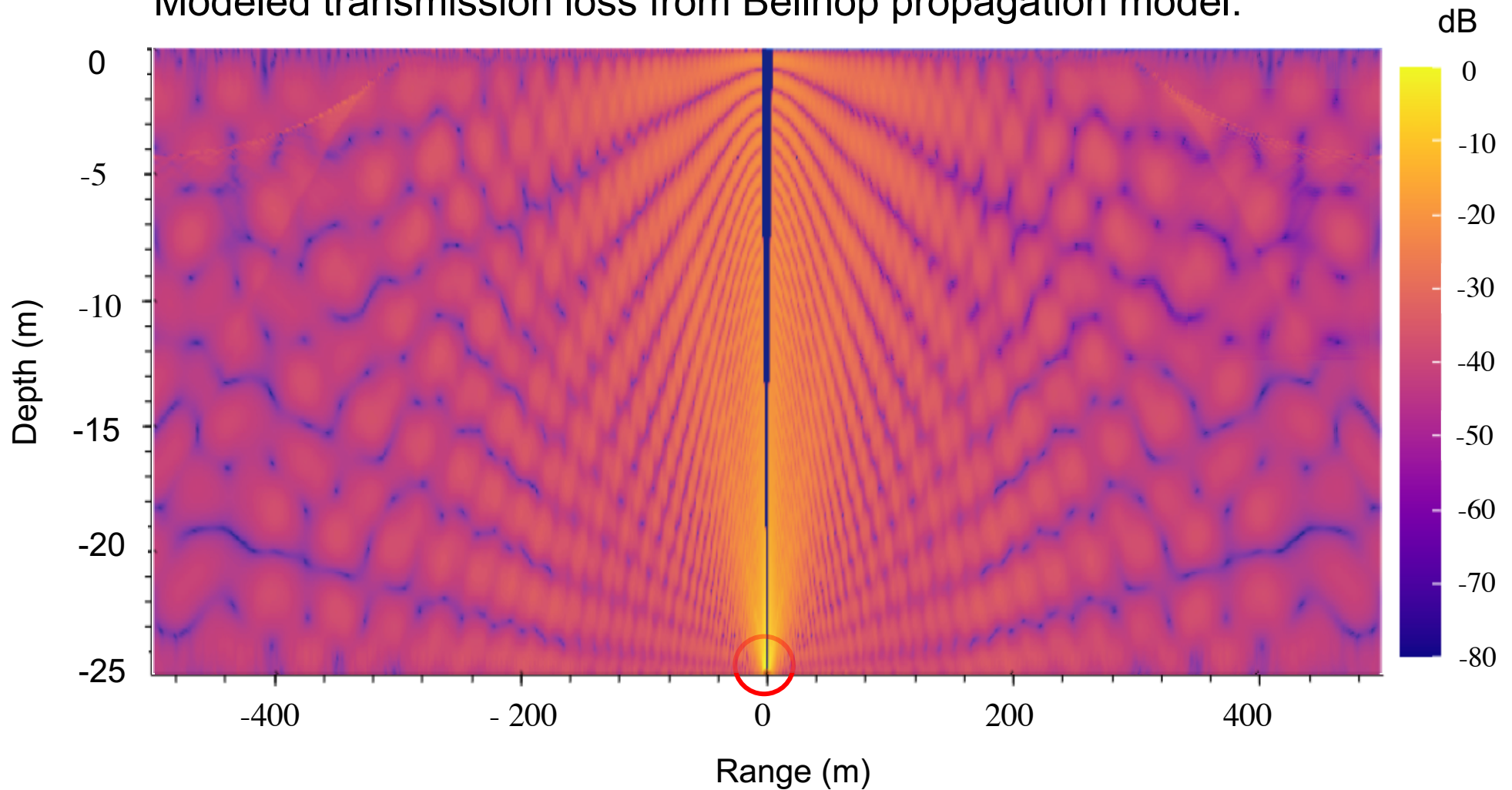
Motivation

A single low cost robot

Approach–Matched Field Processing

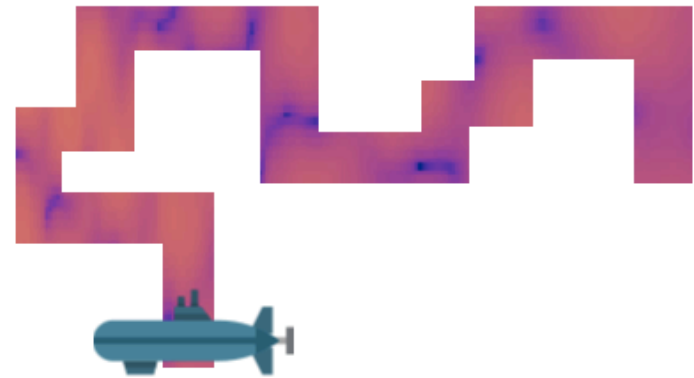Modeled transmission loss from Bellhop propagation model:

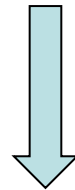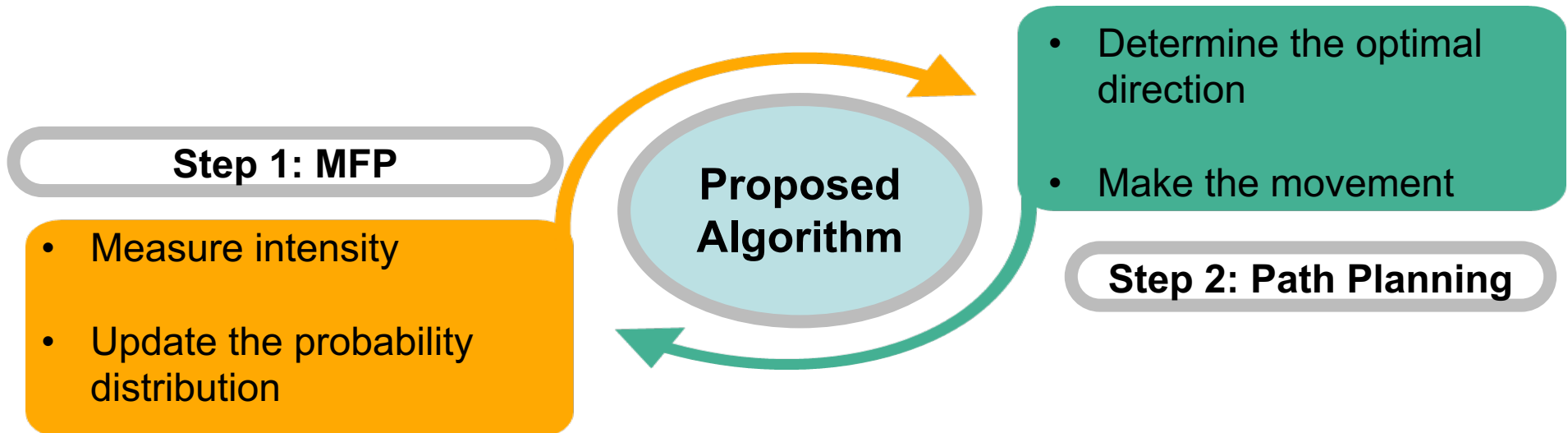# Approach – Adaptive Path Planning

Naïve path:

Adaptively planned path:

Maximize information gain

Localize source faster

Approach

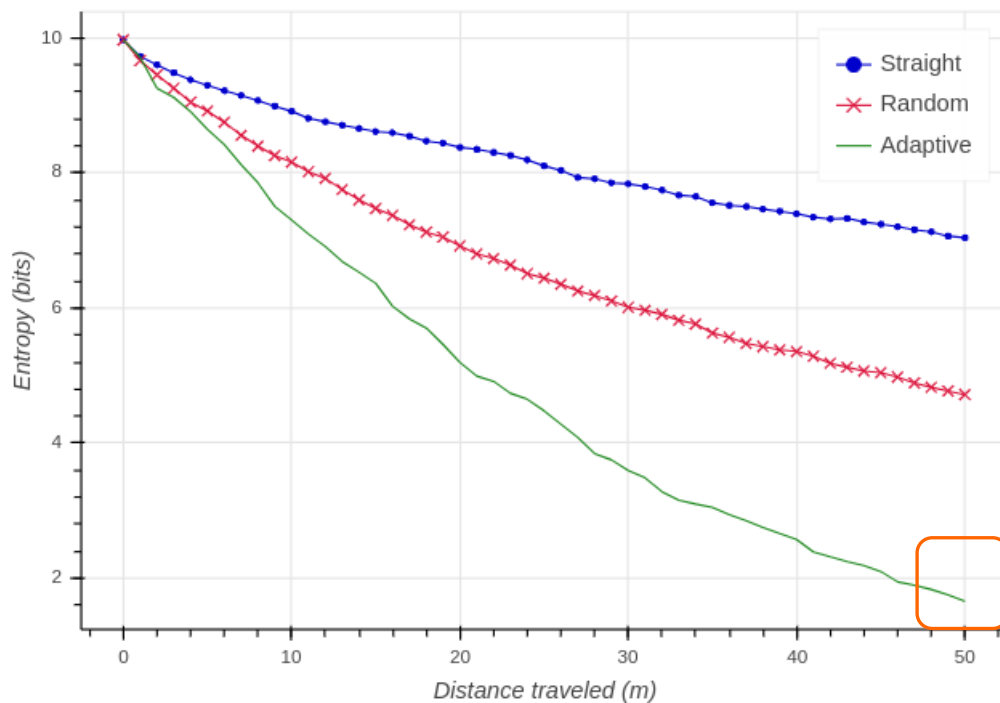**Step 1: MFP**

- Measure intensity

- Update the probability distribution

Proposed Algorithm

- Determine the optimal direction

- Make the movement

Step 2: Path Planning

Until the source location is finalized

Simulation Results

Average over 100 runs

Policy	RMS Error	No. of outliers
Straight	239.0 m	0/100
Random	61.3 m	13/100
Adaptive	1.0 m	9/100

Evolution of overall estimated entropy of source location for the three policies

10%-trimmed RMS localization error for the three policies

Thank you !