Insper

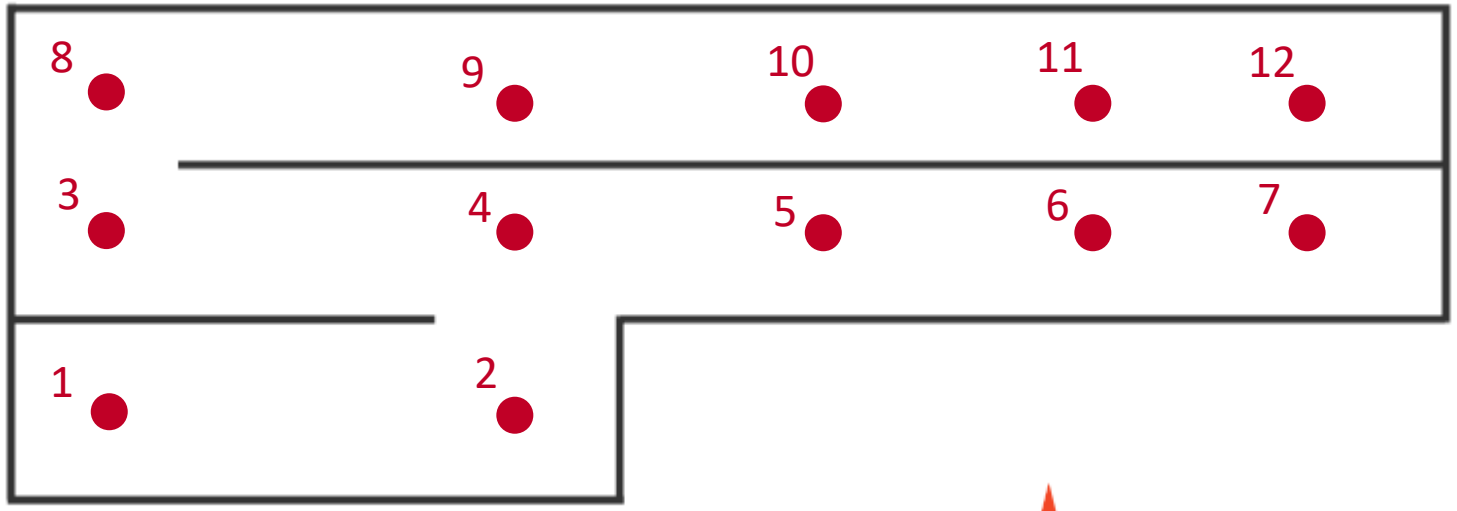
Robótica Computacional

SLAM

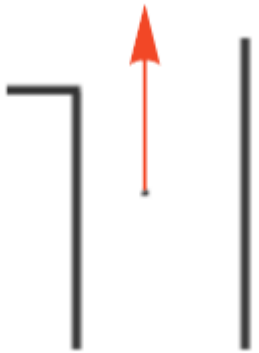
Localização

Dado o seguinte mapa

Onde Está o robô?



Leitura do Laser:



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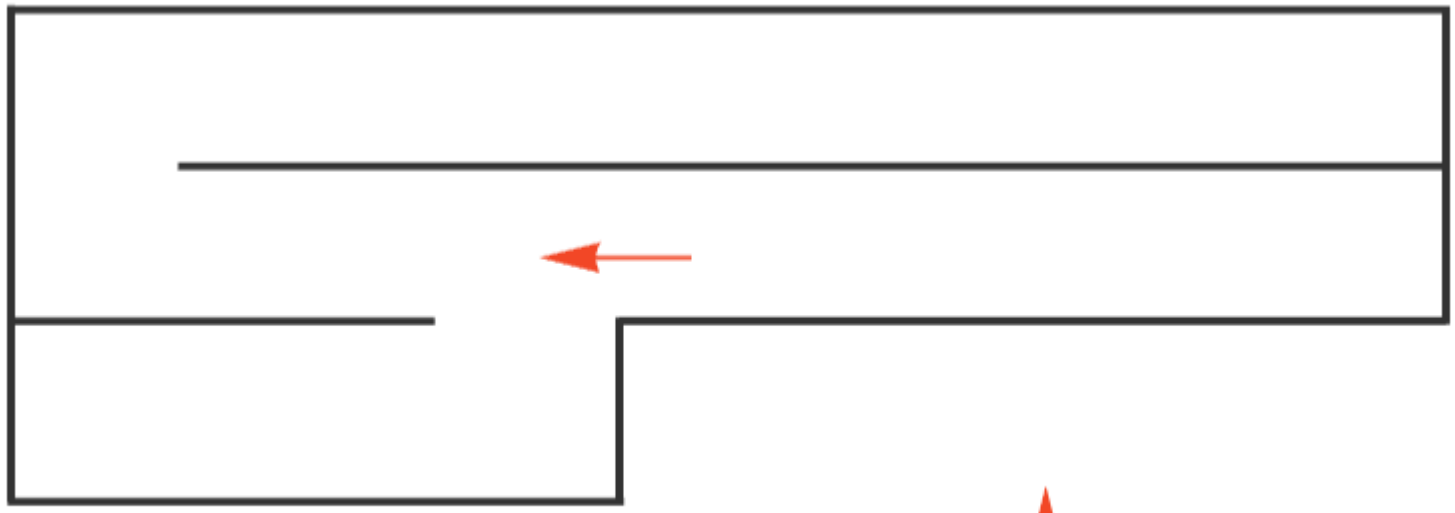

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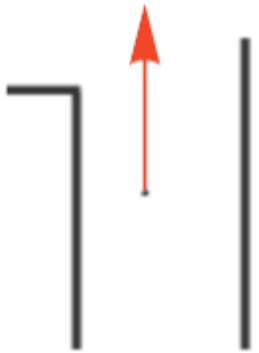

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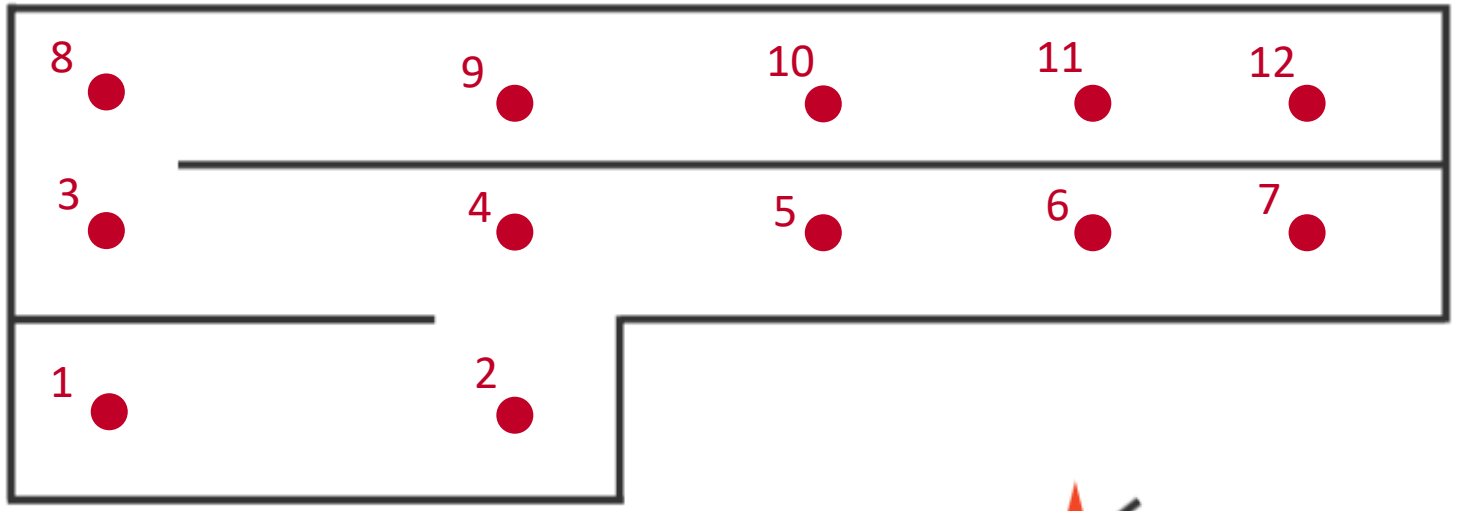

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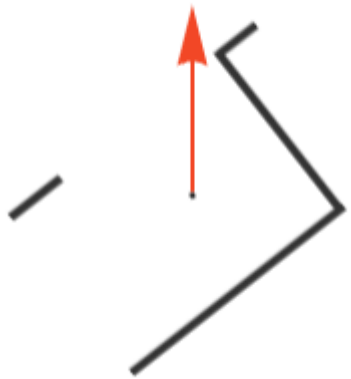

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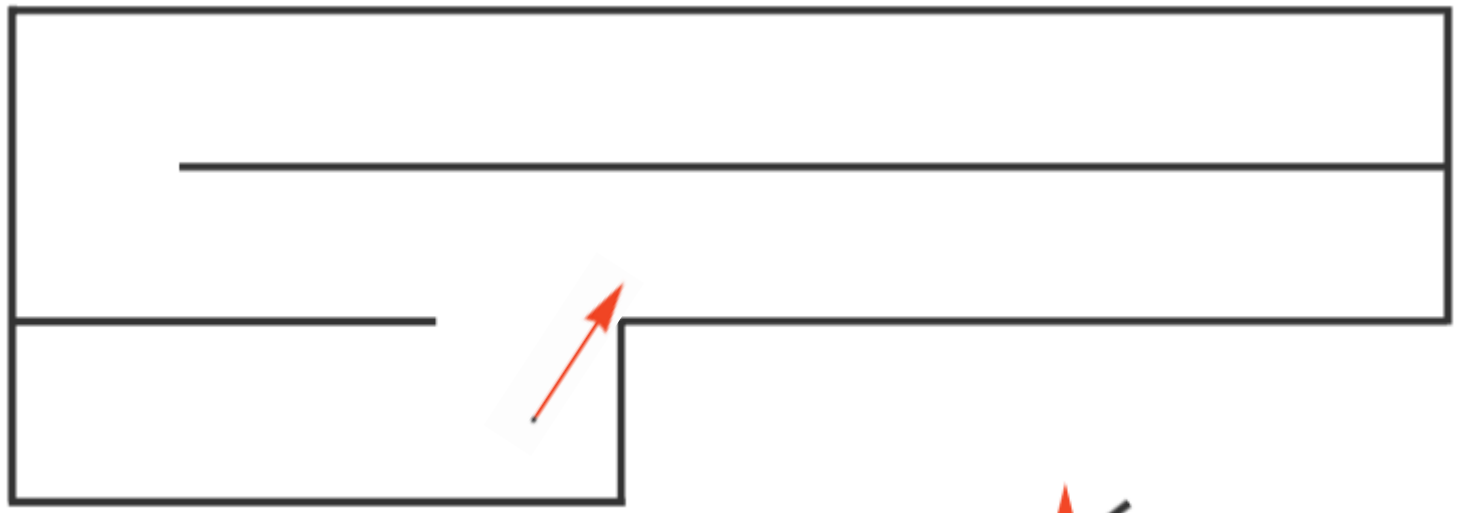

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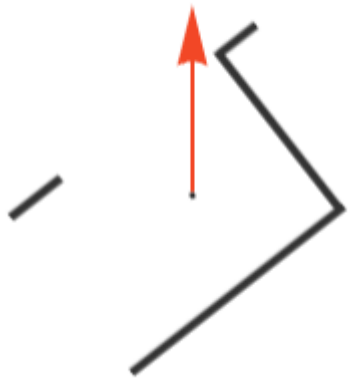

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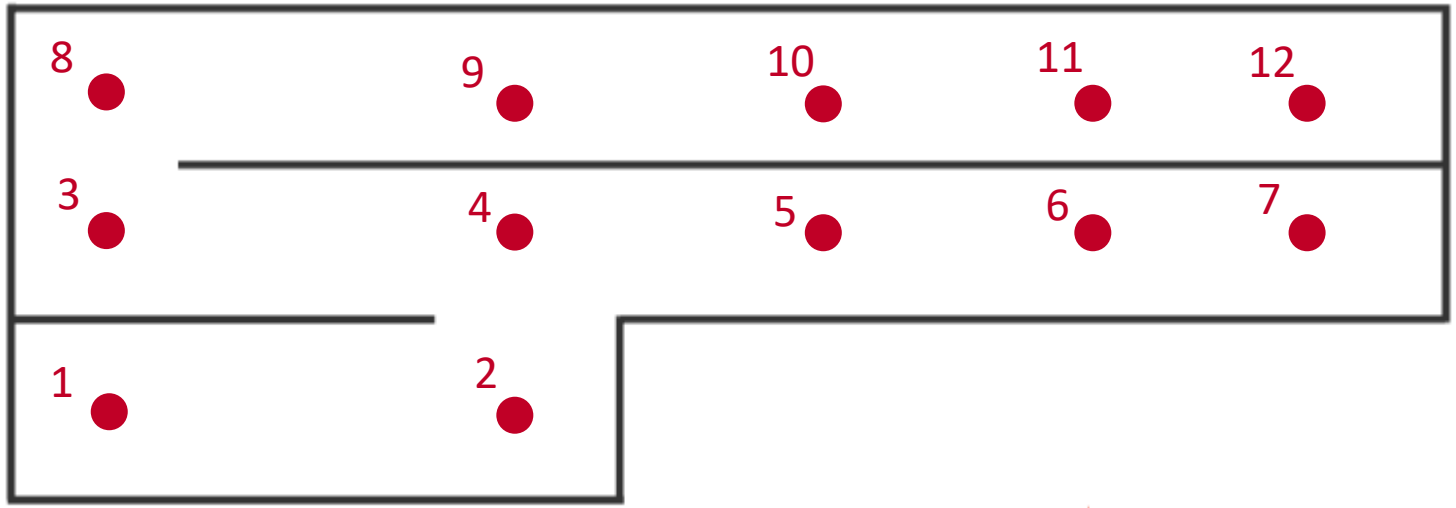
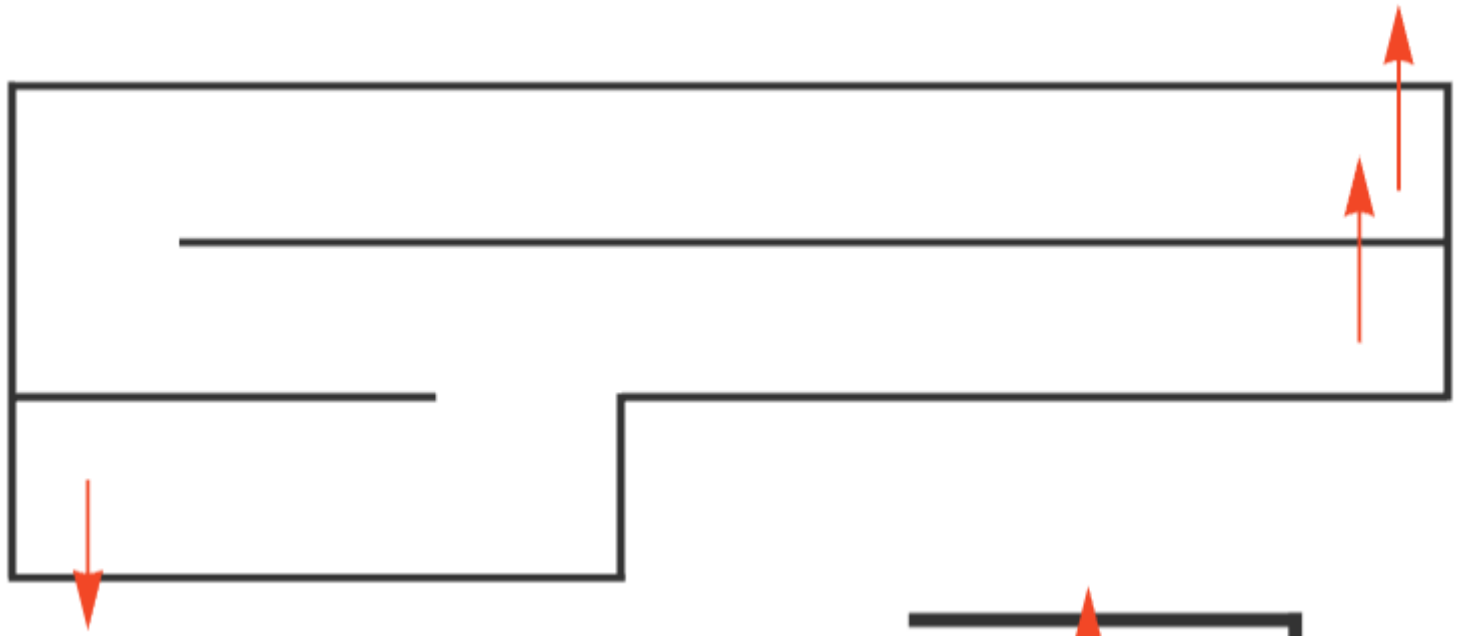


Leitura do Laser:

Insper

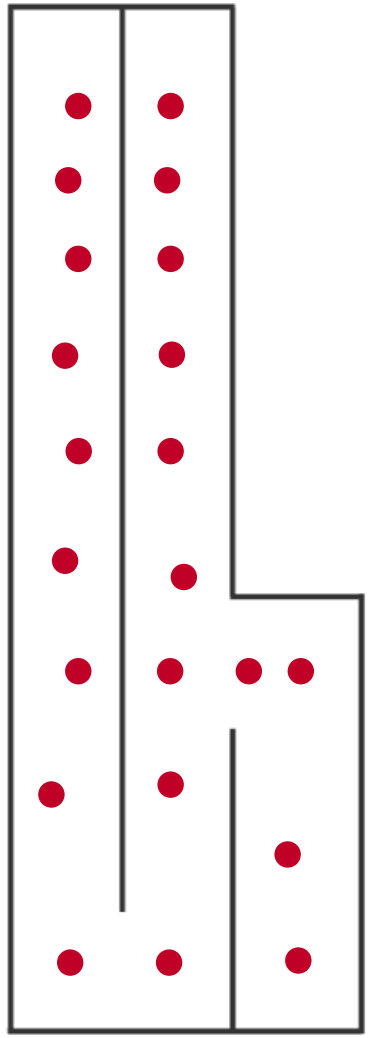
Onde Está o robô?



Leitura do Laser:

Monte Carlo Localization

1. Recebe a Leitura do Sensor (Laser 2D)
2. Seleciona N pontos de localização hipotéticos (partículas)
3. Simula-se qual seria a leitura do laser para cada partícula
4. Calcula-se o erro entre a leitura real e simulada de cada partícula
5. Faz um “resampling”, onde as melhores partículas são mantidas e replicadas.
6. Algoritmo tende a convergir à posição do robô.
7. Se souber a posição anterior do robô o algoritmo é simplificado
    1. Isso resulta método – AMCL (Adaptative Monte-Carlo Localizer)

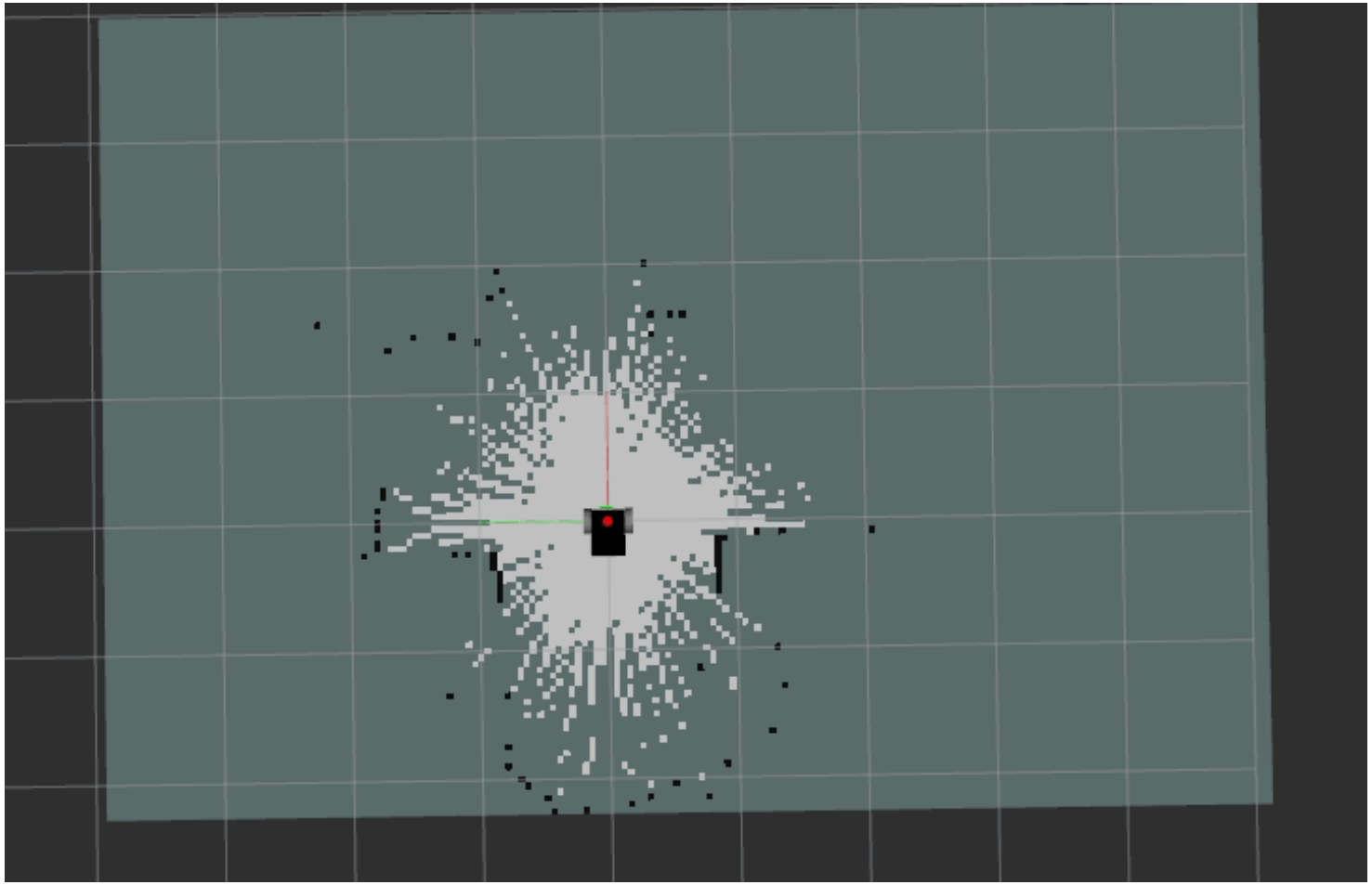


Insper

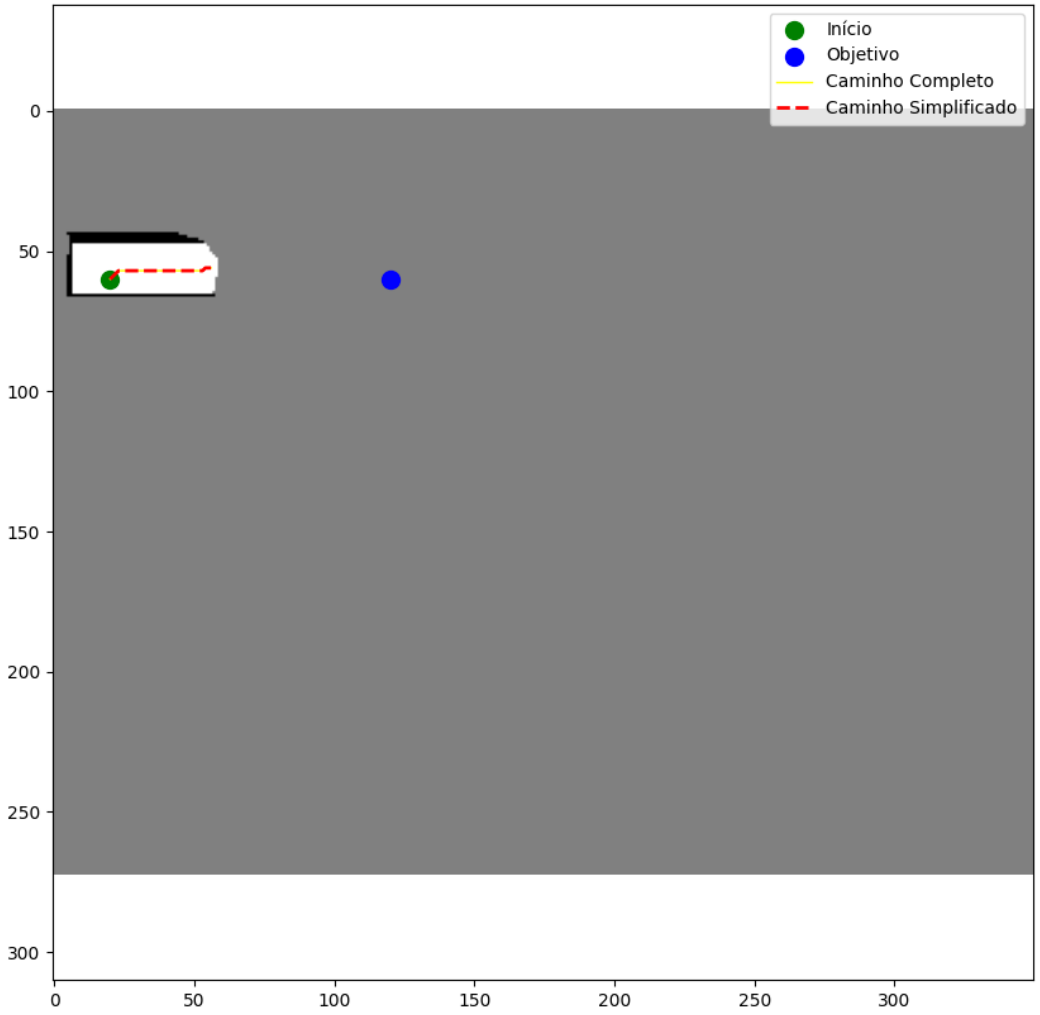
SLAM
(Simultaneous Localization and Mapping)

Mapa de Ocupação

1. Cria uma grade 2D
2. Atribui os seguintes valores:
    - Livre
    - Ocupada
    - Desconhecida
3. Para cada leitura do Laser 2D, cada célula recebe uma probabilidade de estar ocupada.
    - Obstáculos aumenta a probabilidade
    - Livre reduz a probabilidade



SLAM


Início
Objetivo
Caminho Completo
Caminho Simplificado
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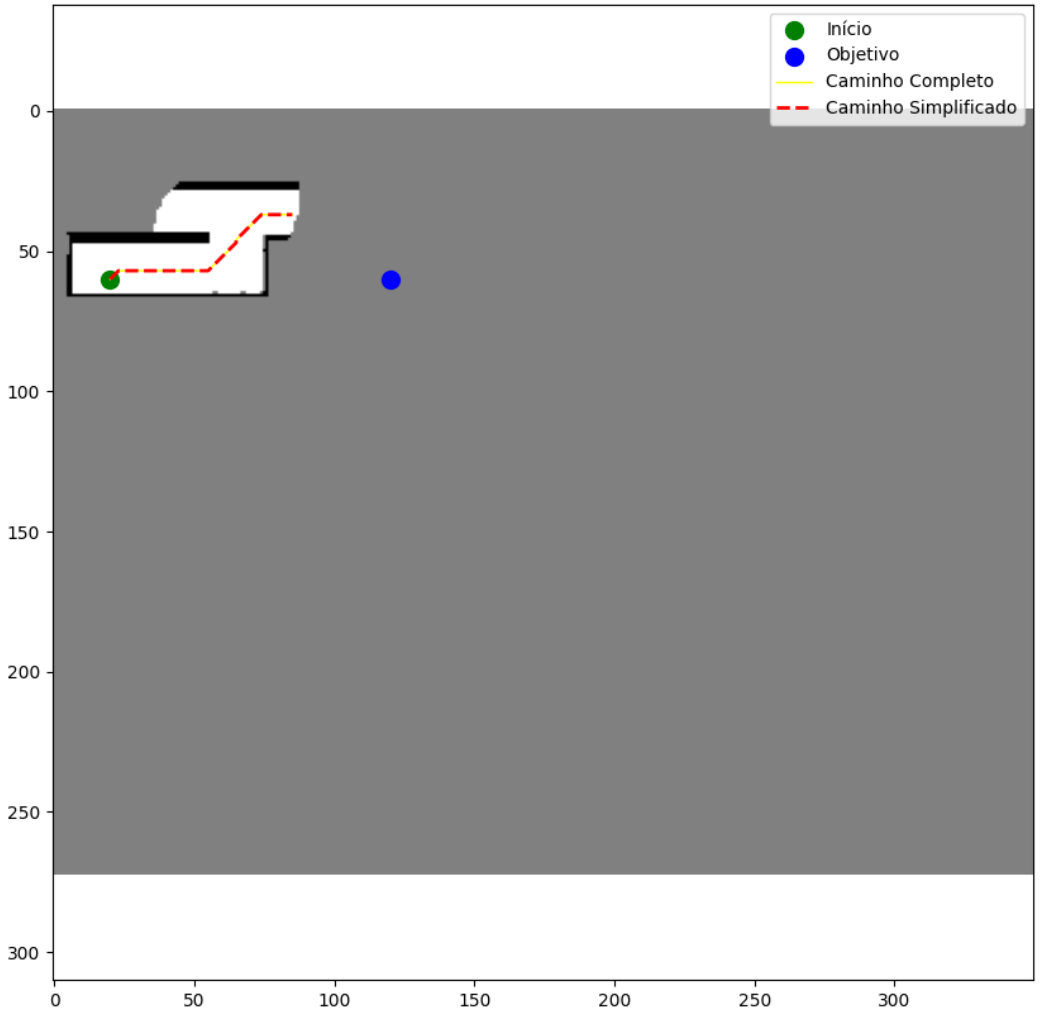
Insper

SLAM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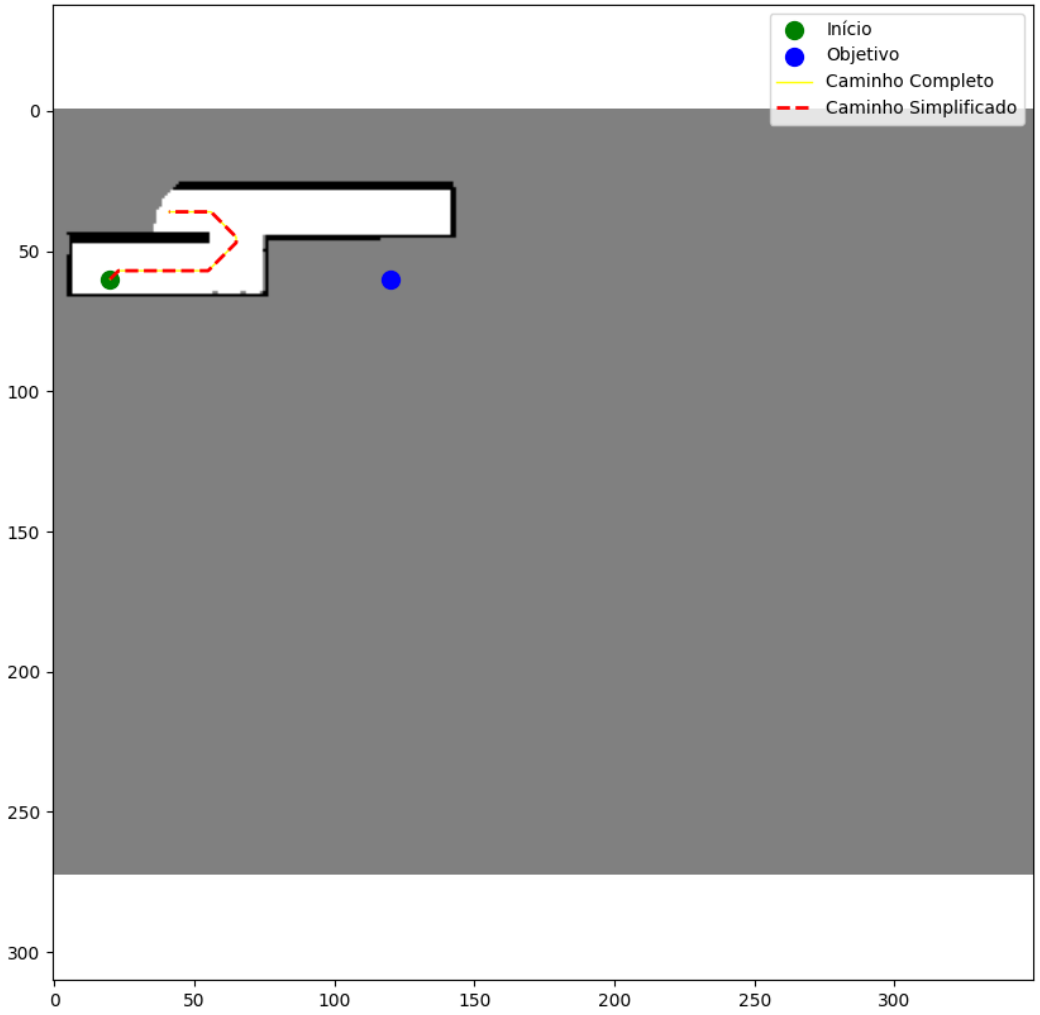
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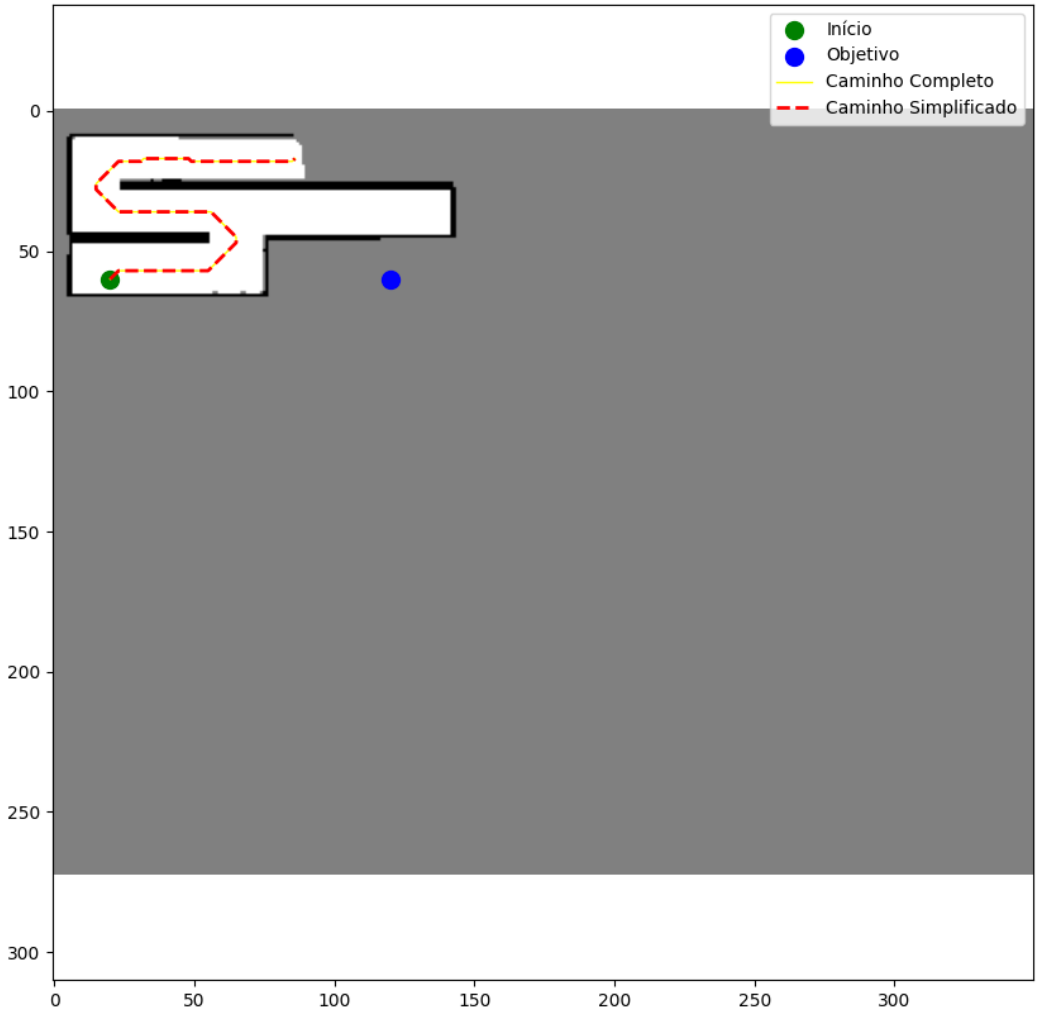
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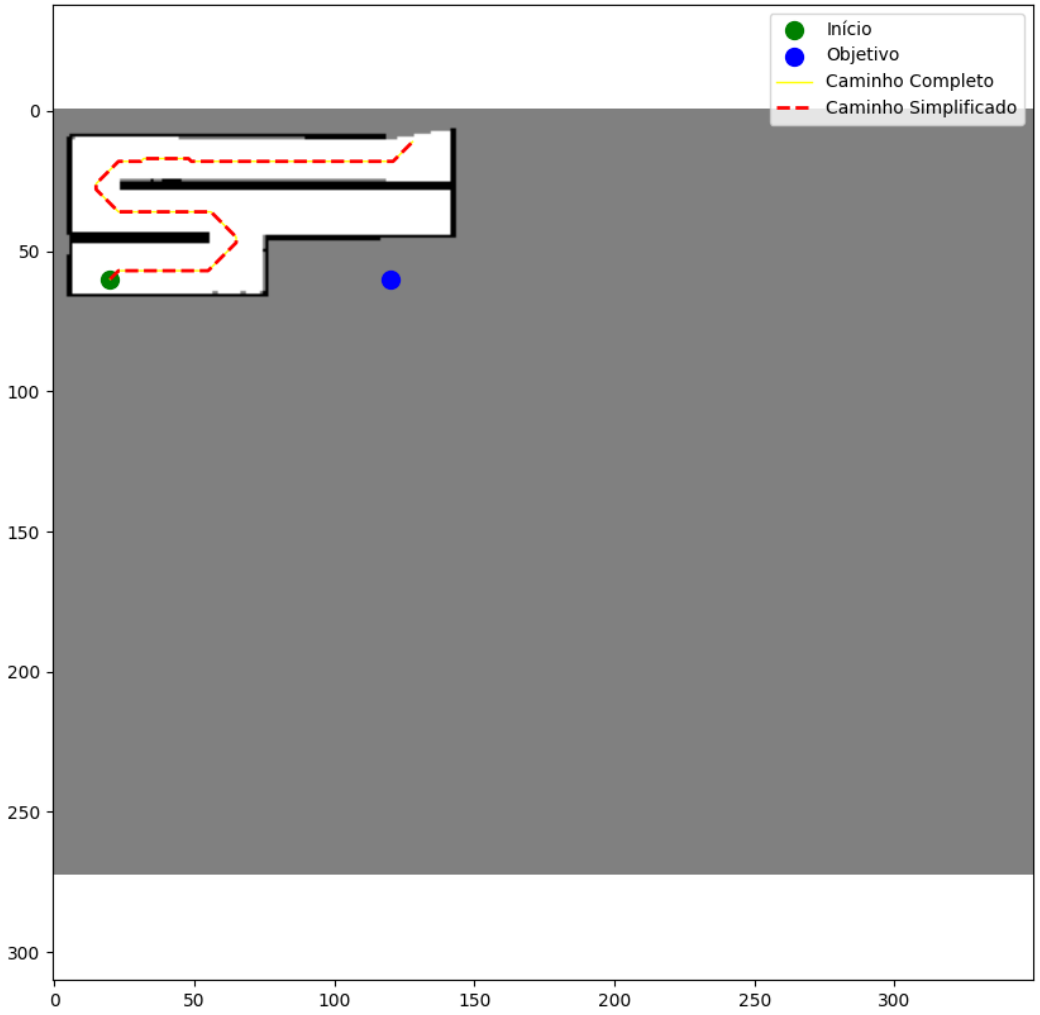
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