

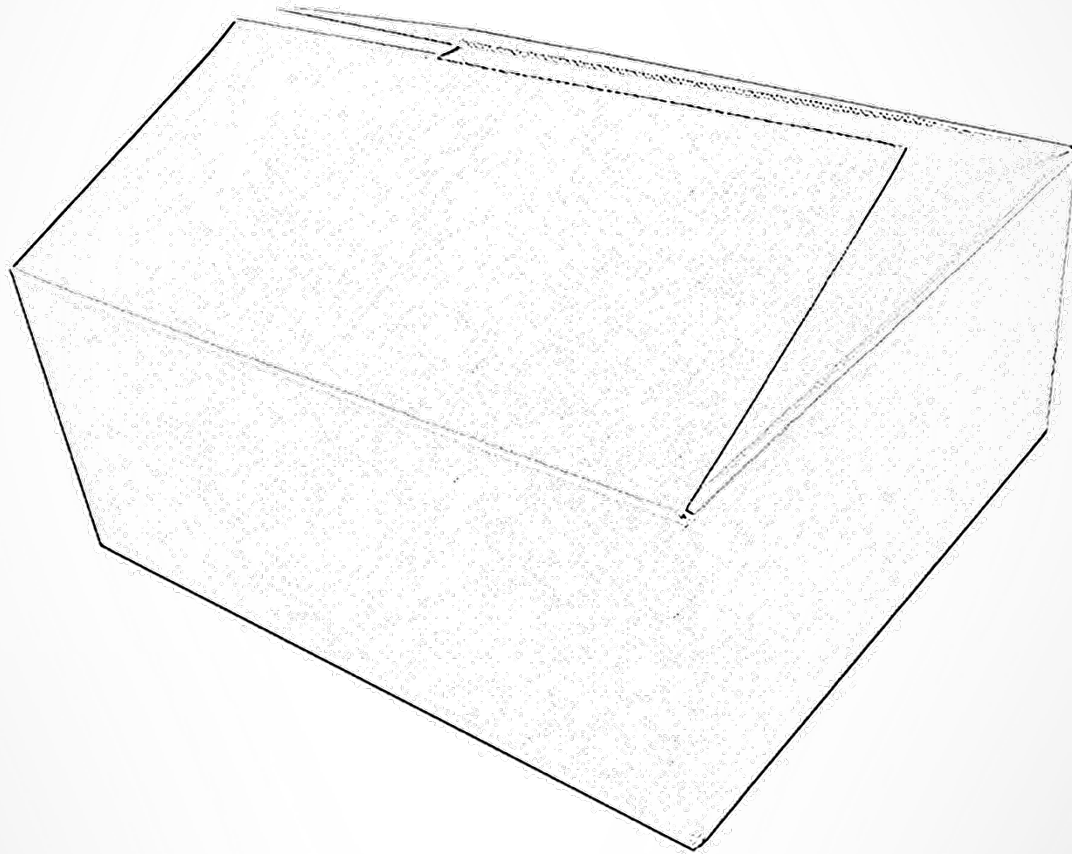
RASTREAMENTO SEM MARCADORES

Veronica Teichrieb – vt@cin.ufpe.br
Rafael Roberto – rar3@cin.ufpe.br

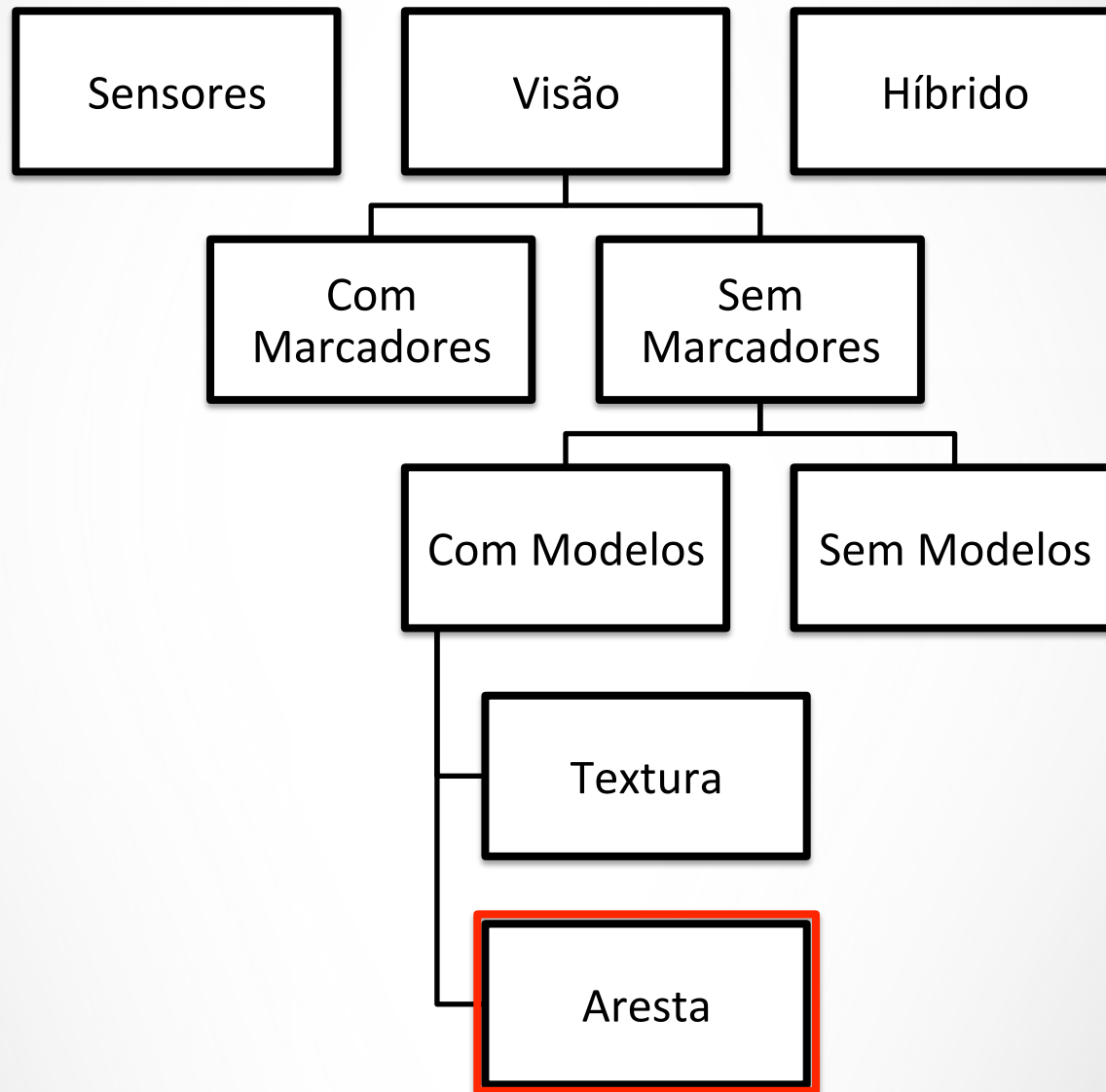
Como calcular a relação cruzada?



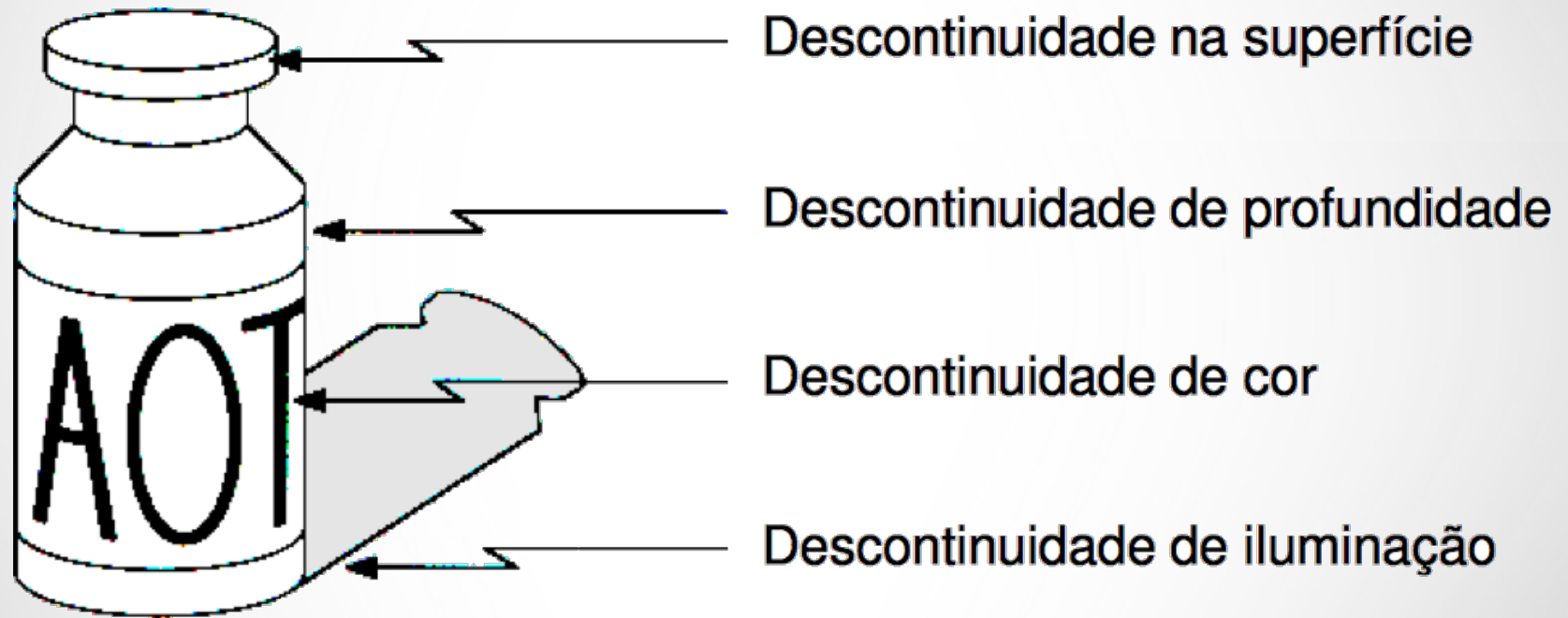
Informações de Arestas



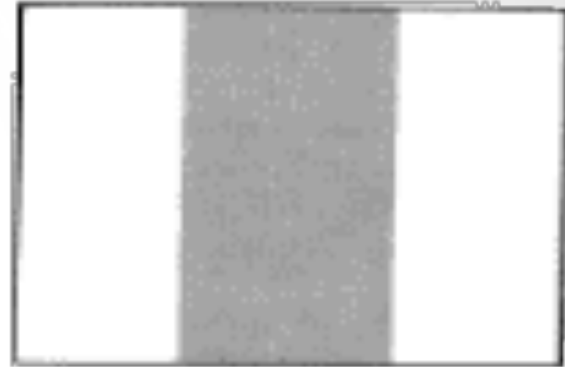
Classificação de Rastreamento



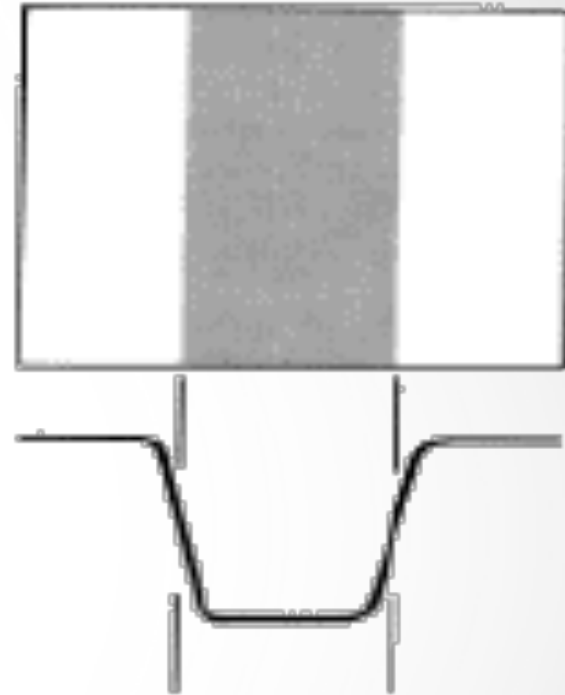
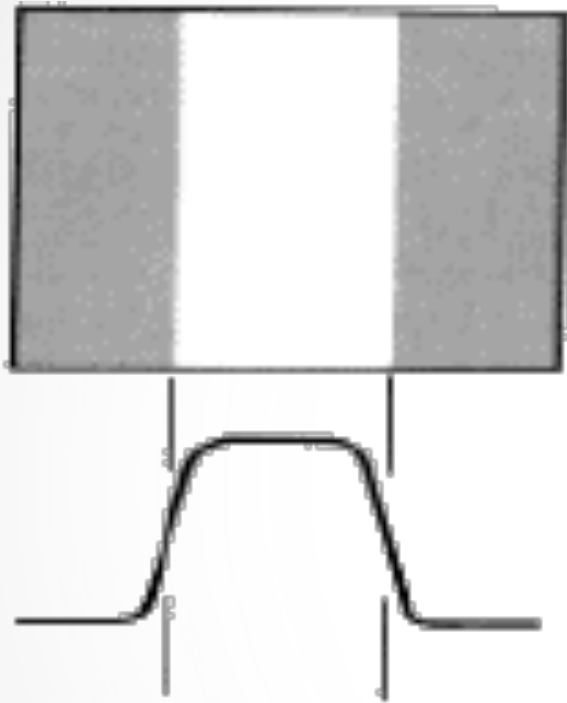
O Que é uma Aresta?



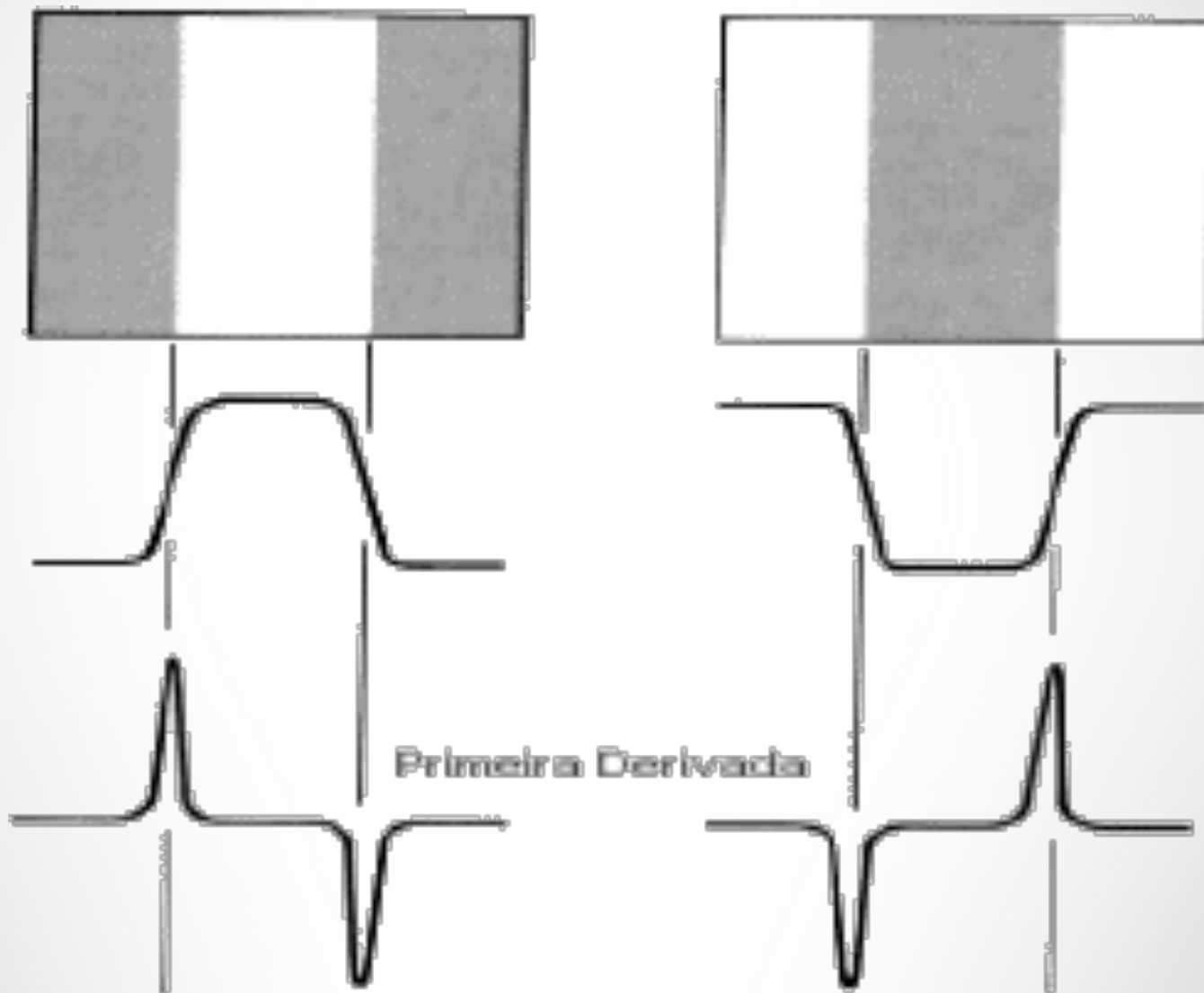
Gradiente



Gradiente



Gradiente



Sobel

- Aproxima a derivada como uma soma ponderada
- Bordas de intensidade e espessuras diferentes

-1	0	1
-2	0	2
-1	0	1

-1	-2	-1
0	0	0
1	2	1

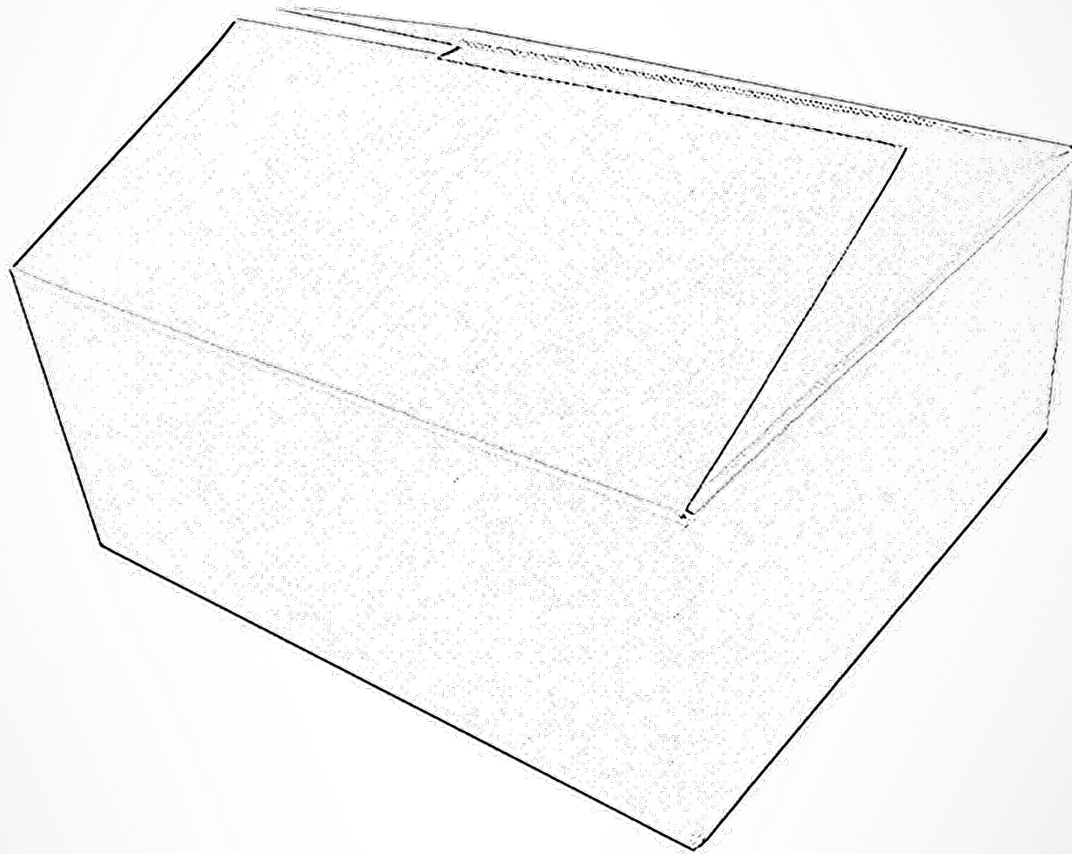
Canny

- Detector ótimo
 - Boa detecção
 - Boa localização
 - Resposta mínima
- Sequencia de passos
 - Suavização da imagem
 - Sobel

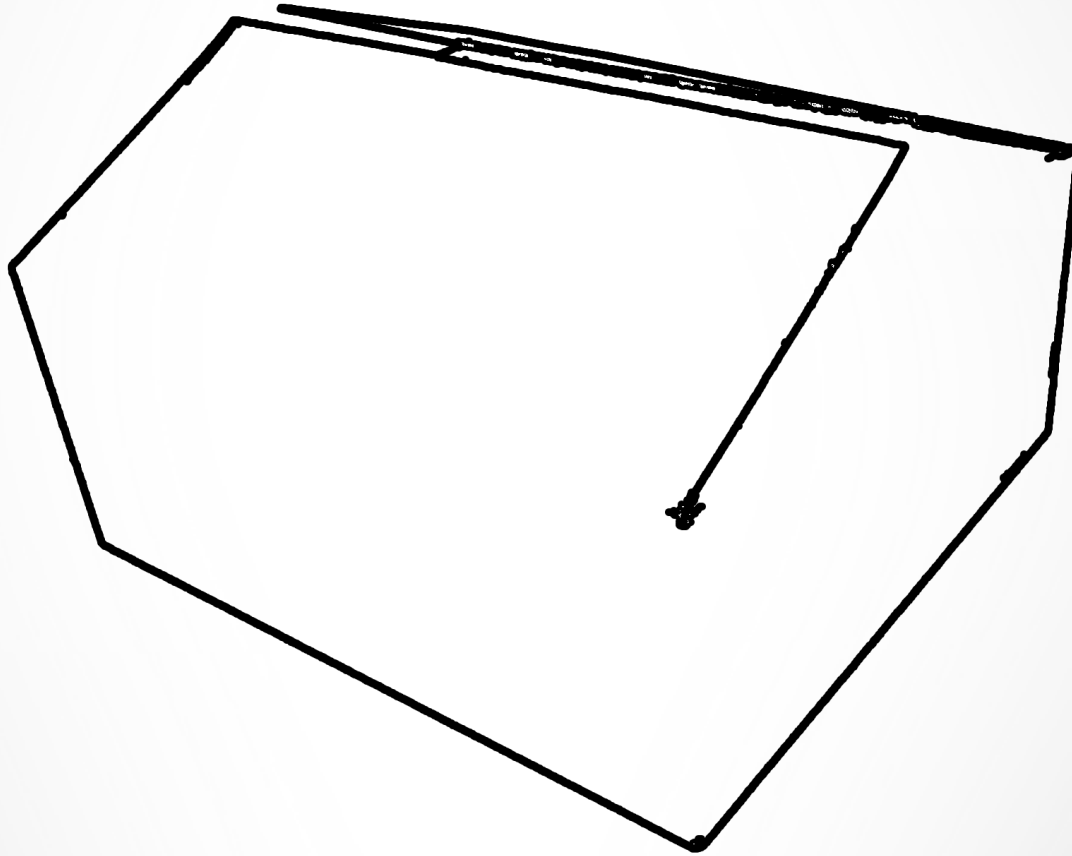
Imagem Original



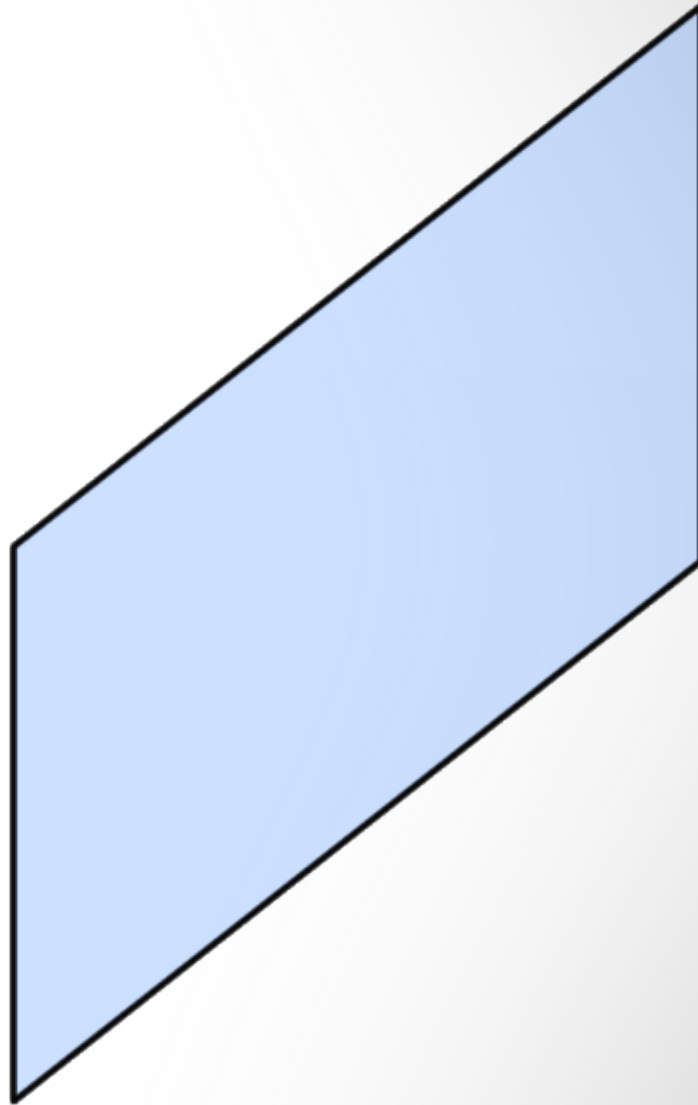
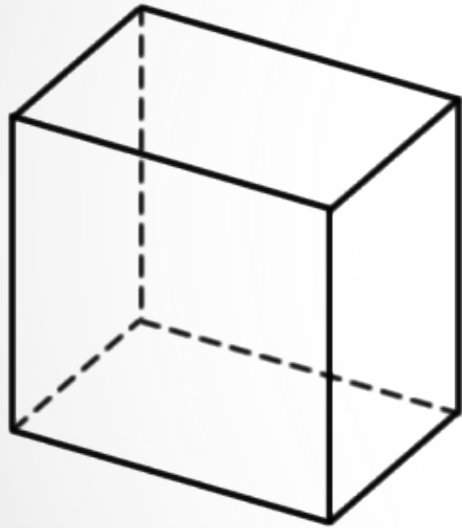
Sobel



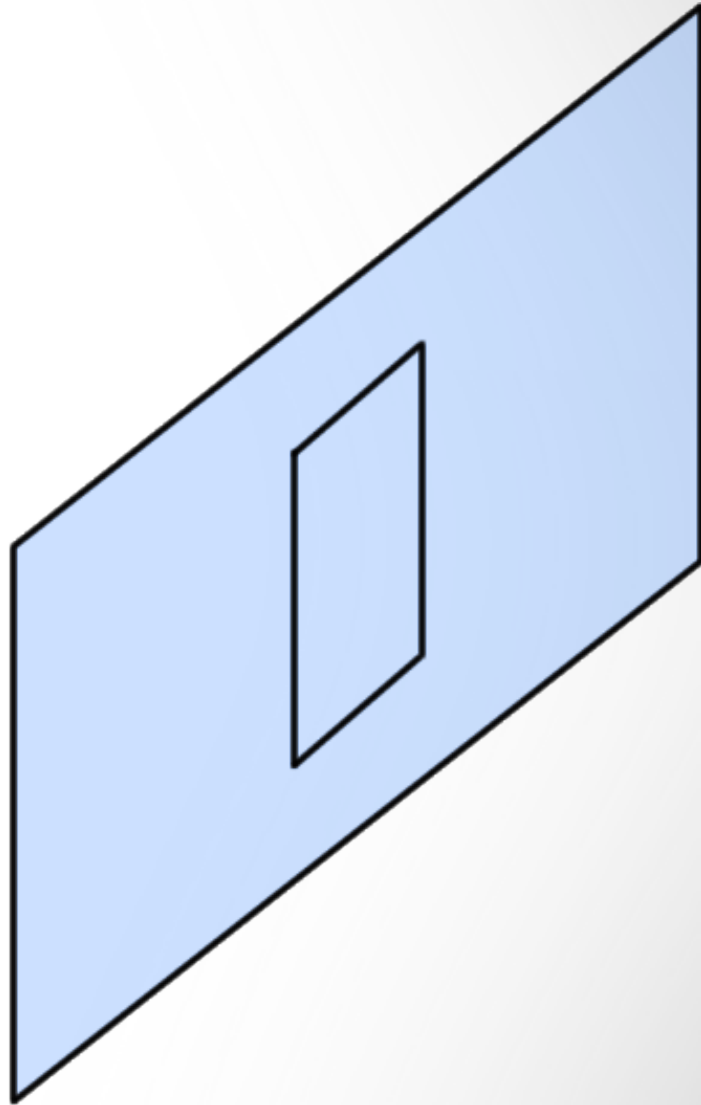
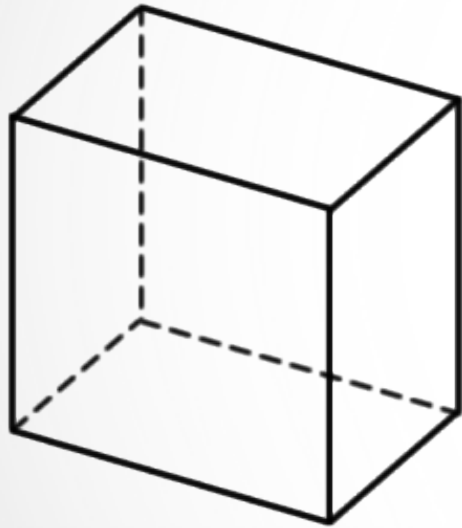
Canny



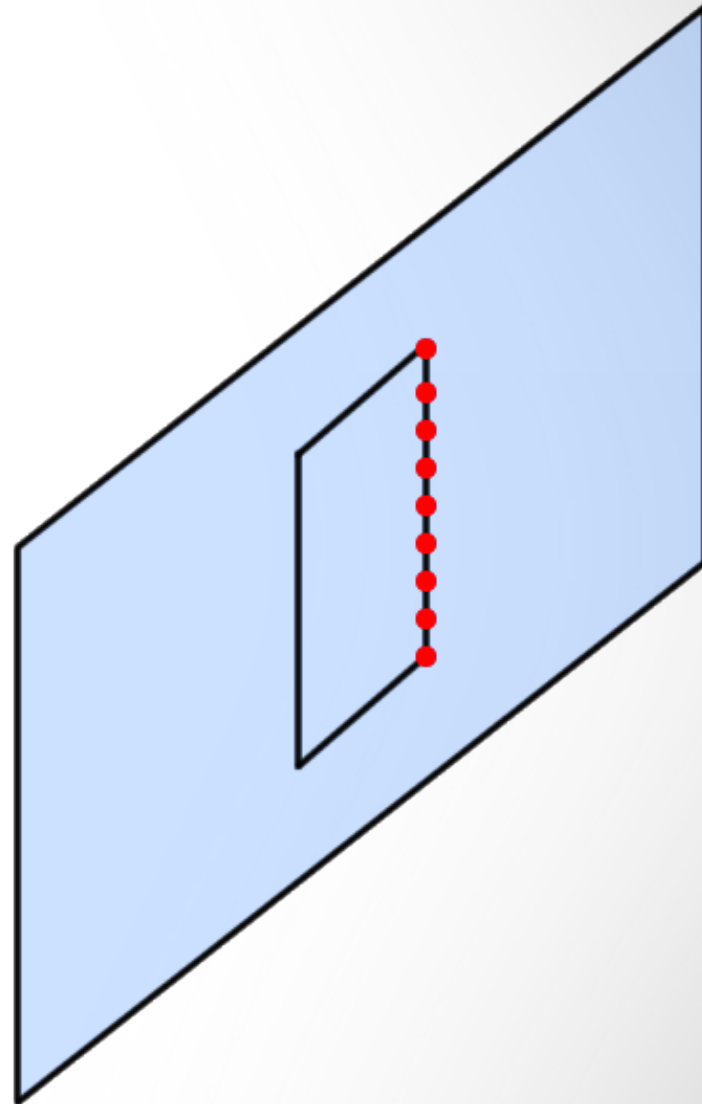
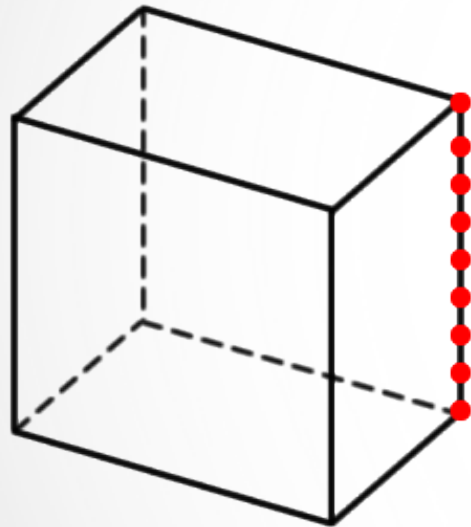
Rastreamento Baseado em Arestas



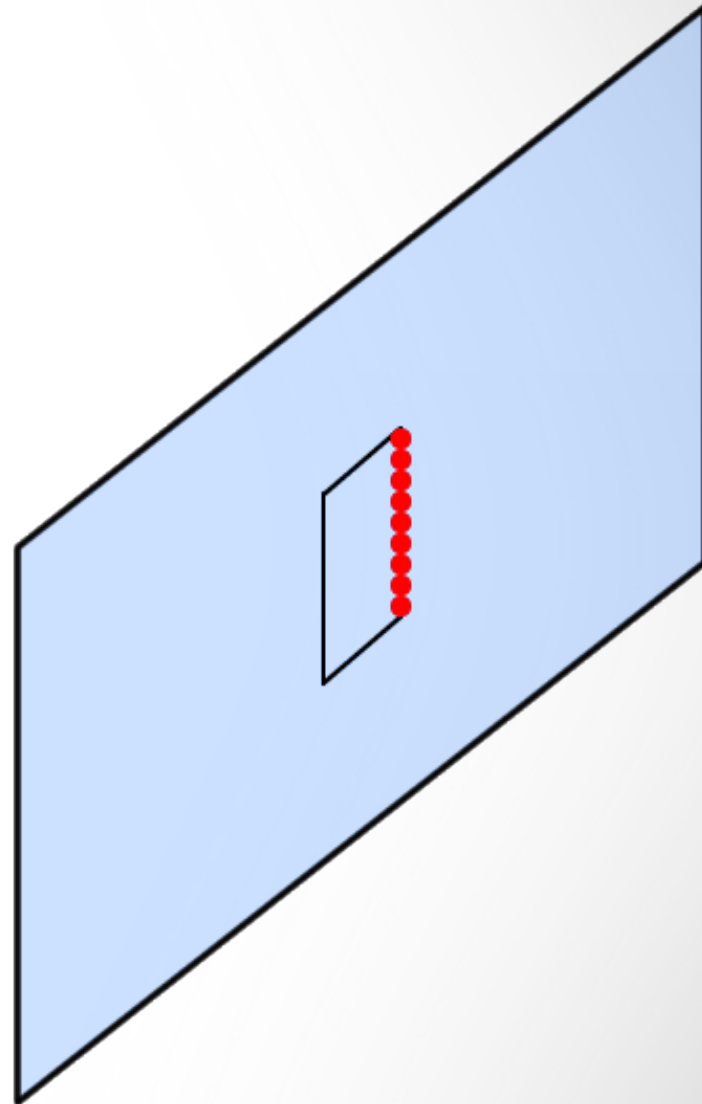
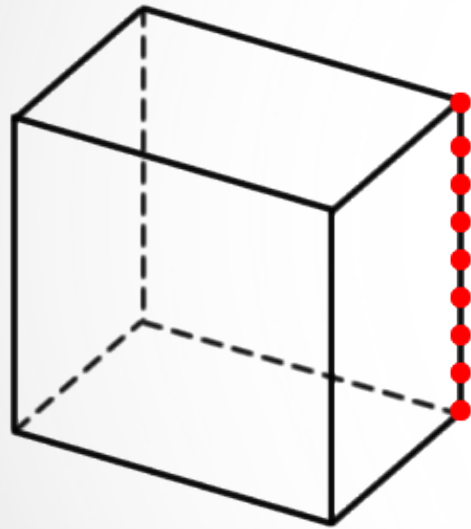
I. Imagem do Quadro Atual



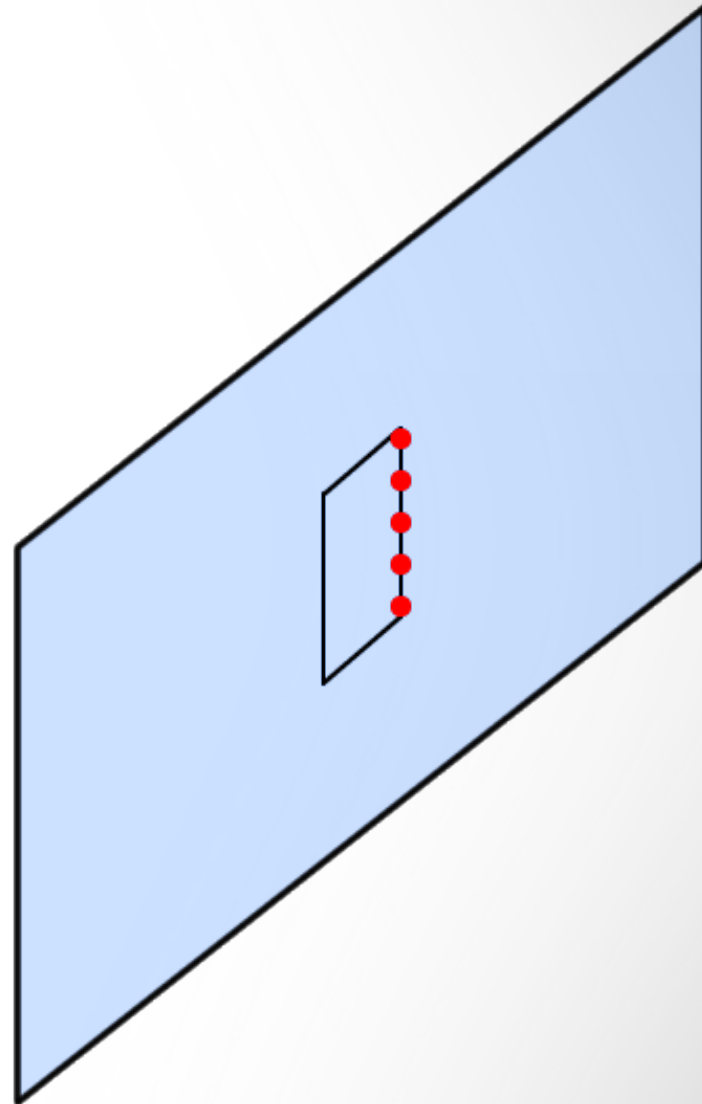
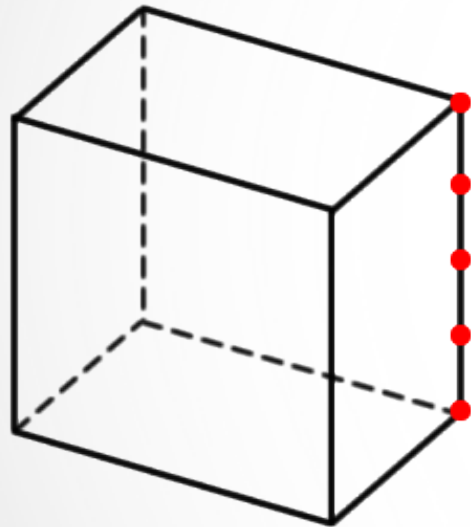
2. Amostragem de Pontos



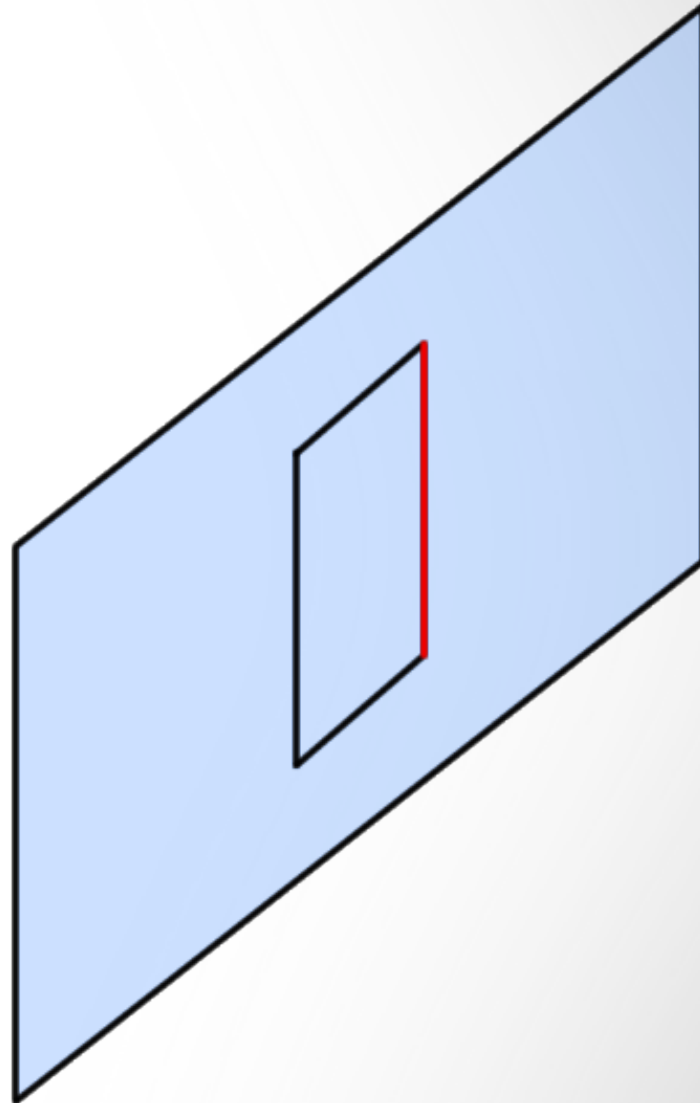
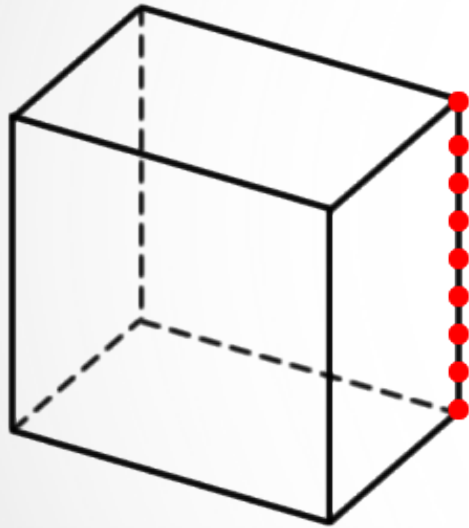
2. Amostragem de Pontos



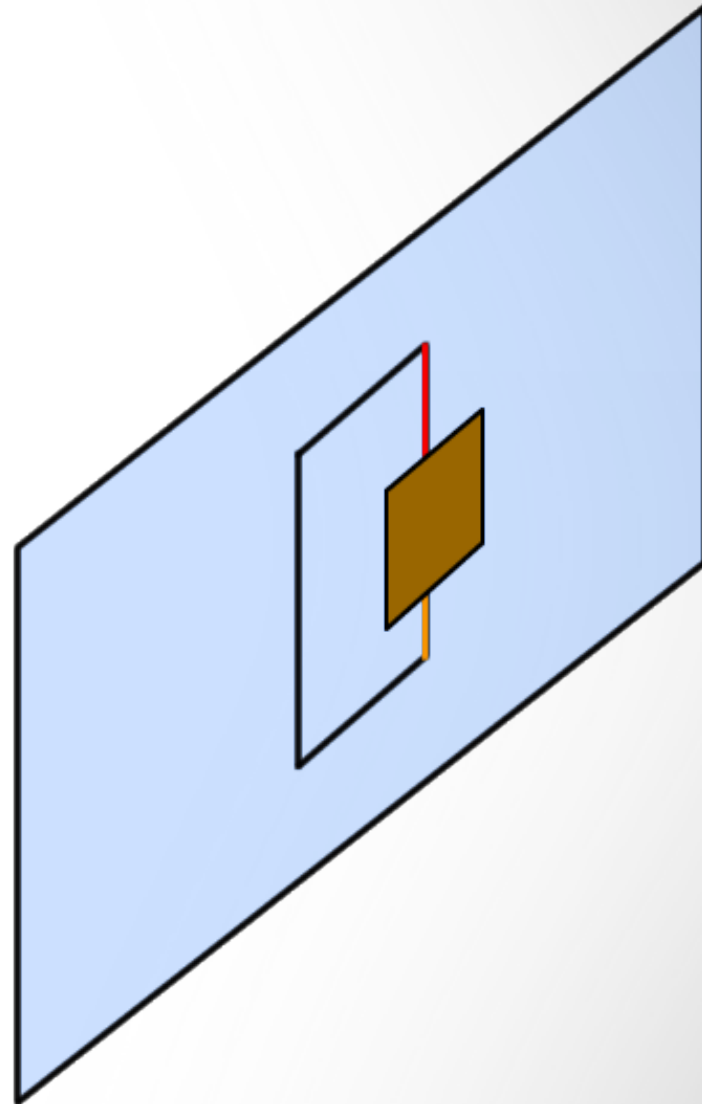
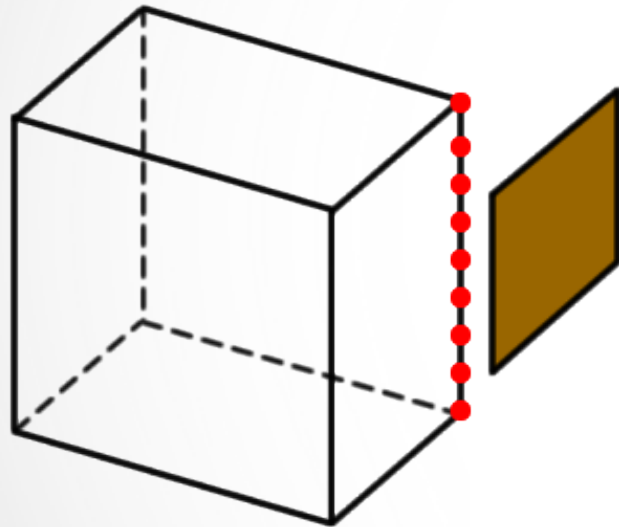
2. Amostragem de Pontos



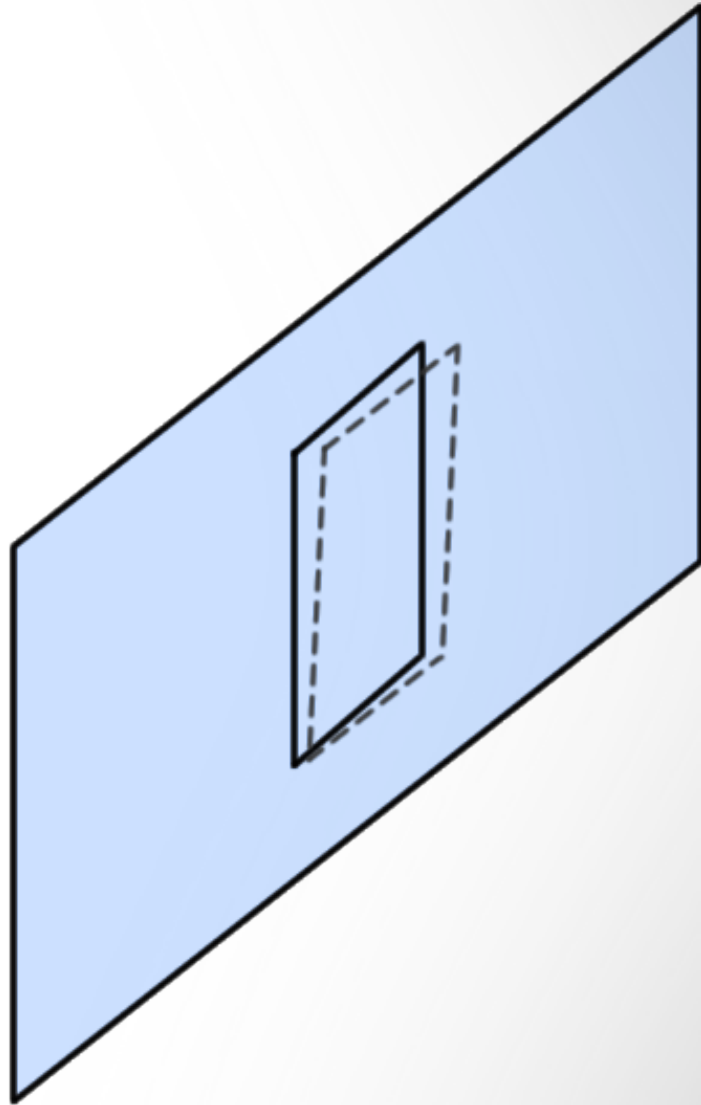
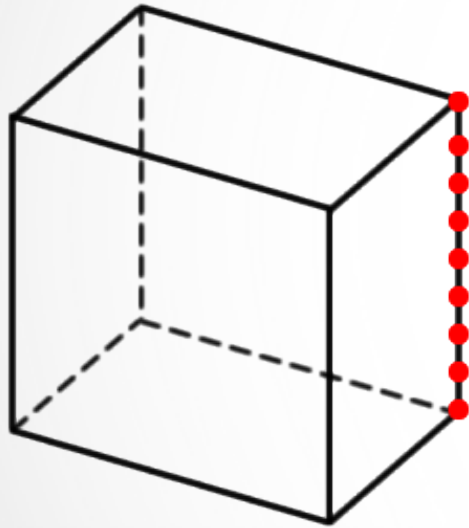
3. Teste de Visibilidade



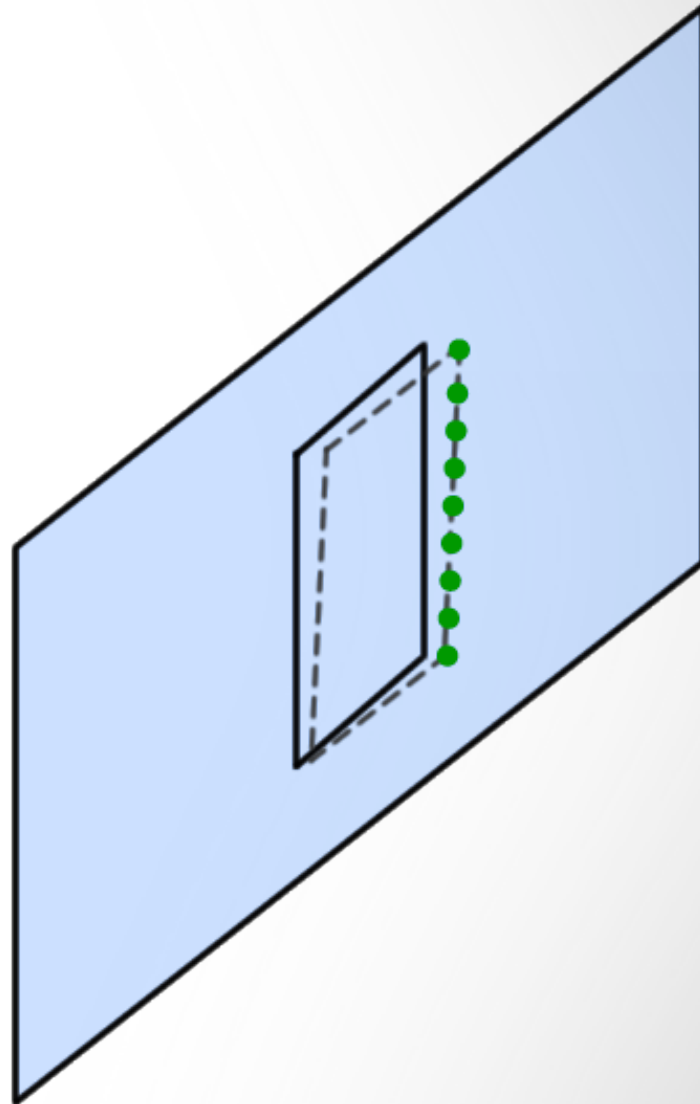
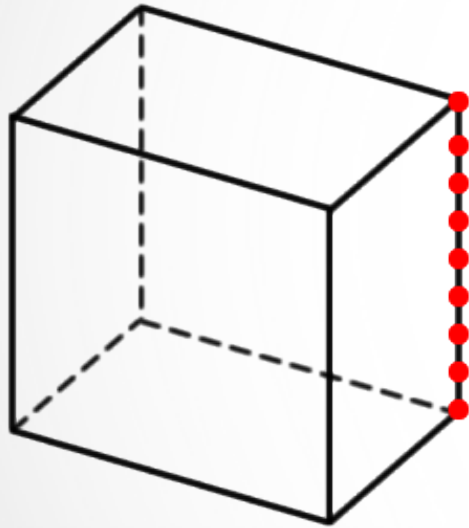
3. Teste de Visibilidade



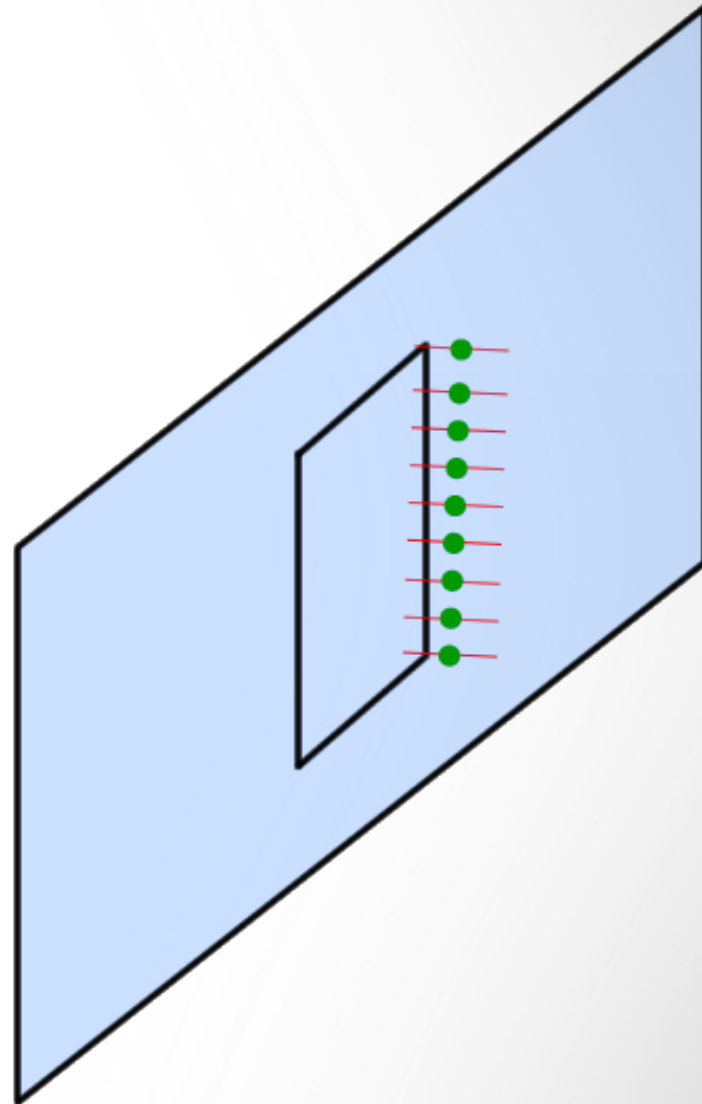
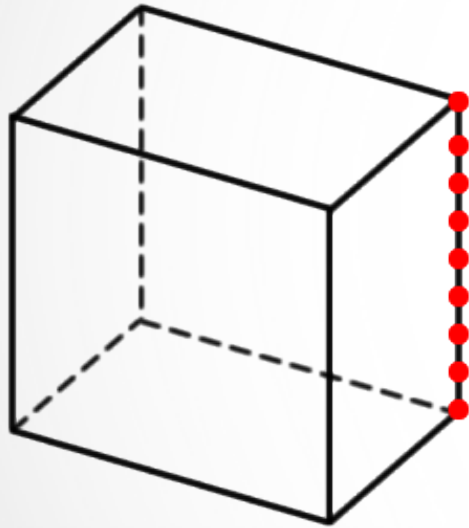
4. Casamento de Pontos



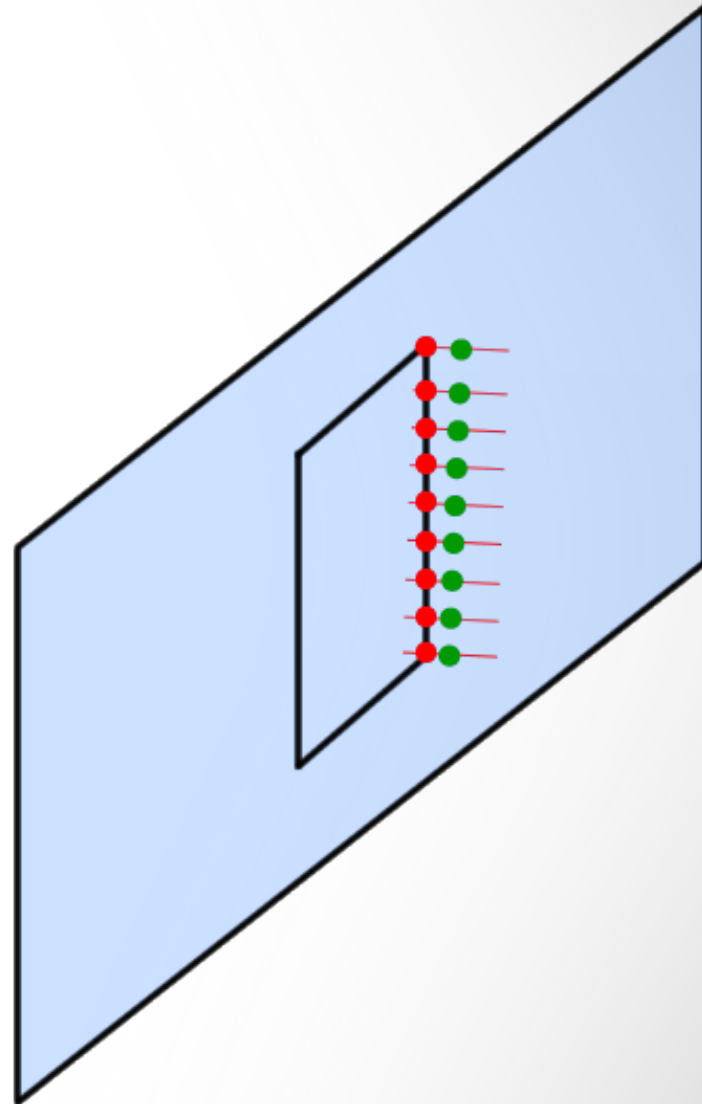
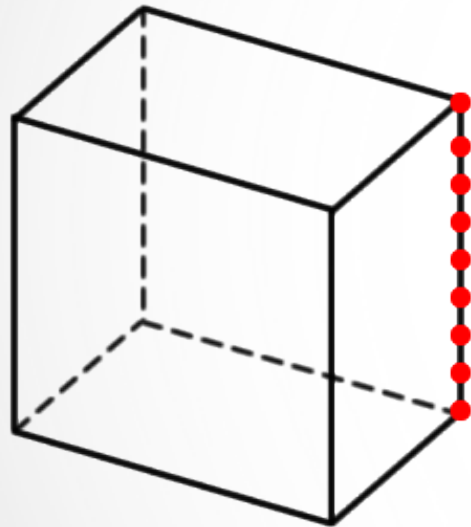
4. Casamento de Pontos



4. Casamento de Pontos



4. Casamento de Pontos



5. Cálculo da Pose

- Minimiza o erro de reprojeção

$$\text{dist}(P(M_i), m_{i-1})$$

5. Cálculo da Pose

- Minimiza o erro de reprojeção

$$\min_{R,T} \sum_i \text{dist}(P(M_i), m_{i-1})$$

5. Cálculo da Pose

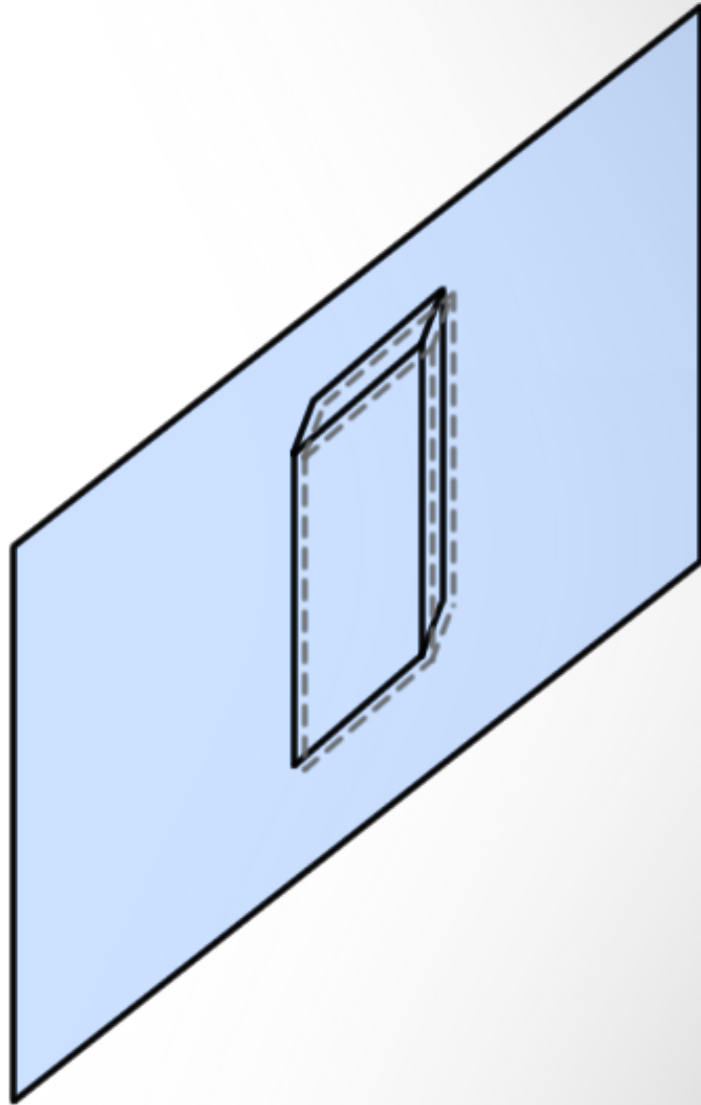
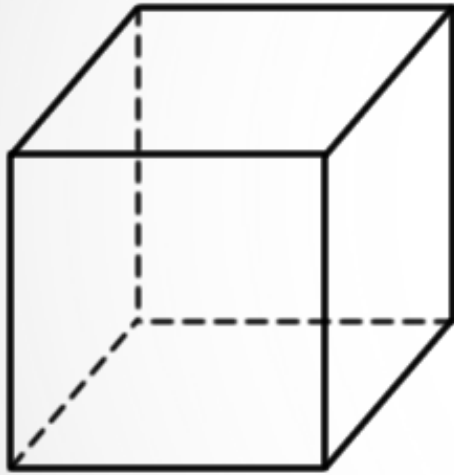
- Minimiza o erro de reprojeção

$$\min_{R,T} \sum_i \rho \cdot \text{dist}(P(M_i), m_{i-1})$$

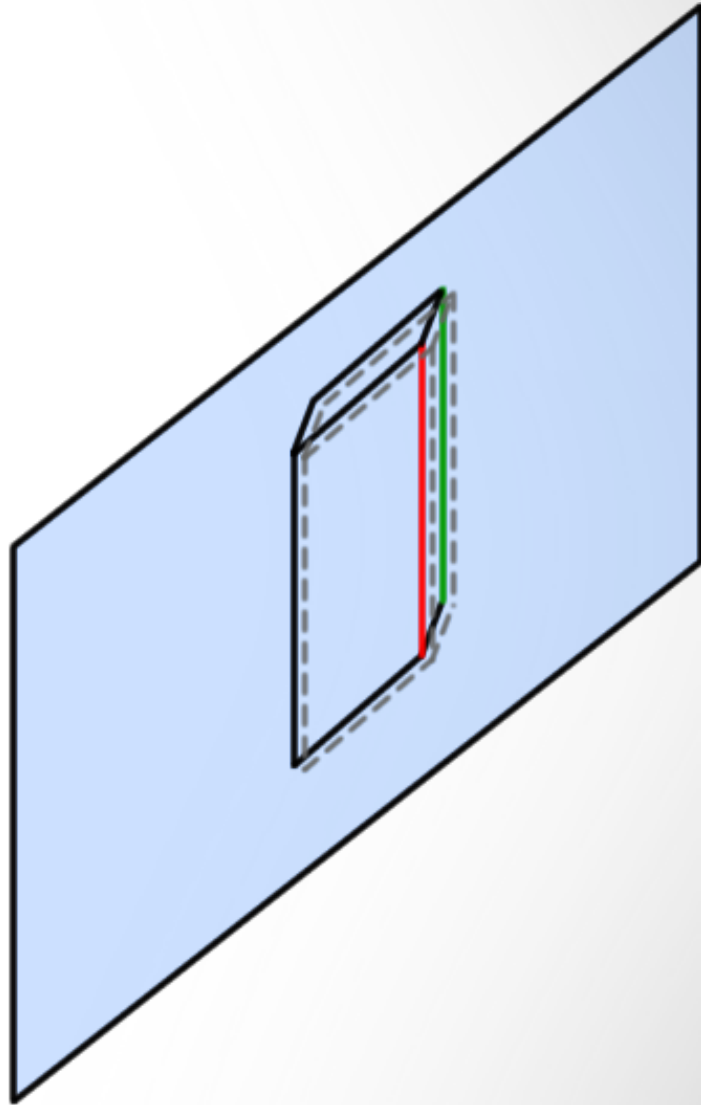
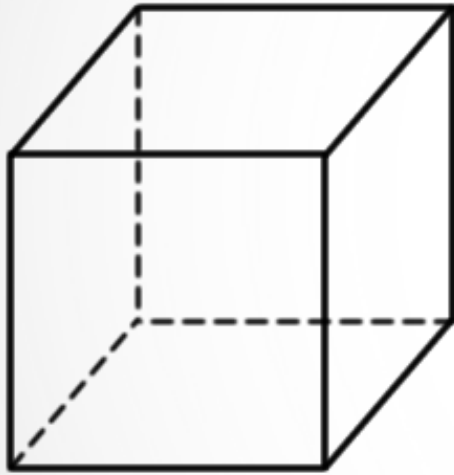
5. Cálculo da Pose

- Levenberg-Marquardt
 - Sistemas de mínimos quadráticos
 - Utiliza o método de Gauss-Newton e gradiente descendente

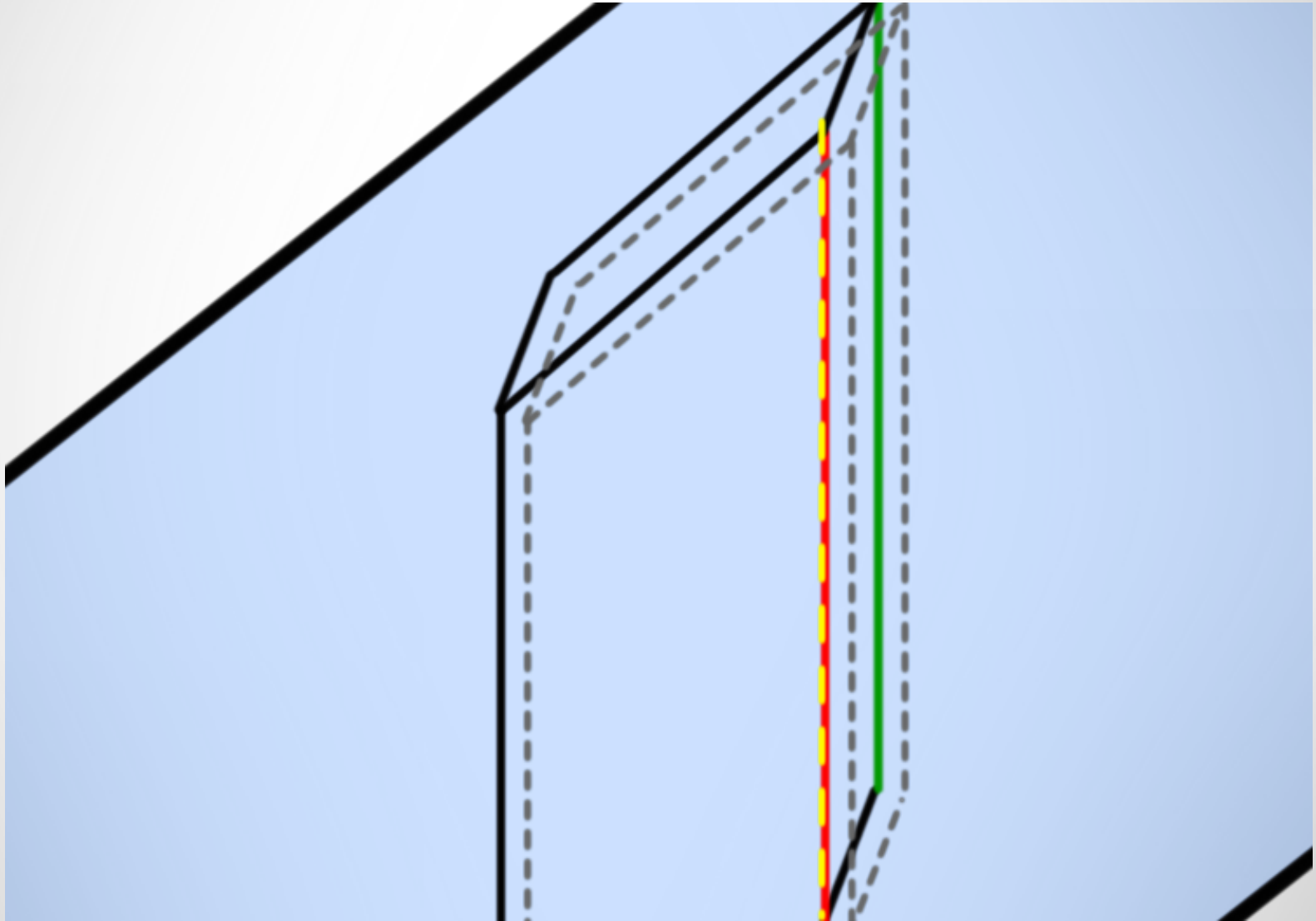
Multiplas Hipóteses



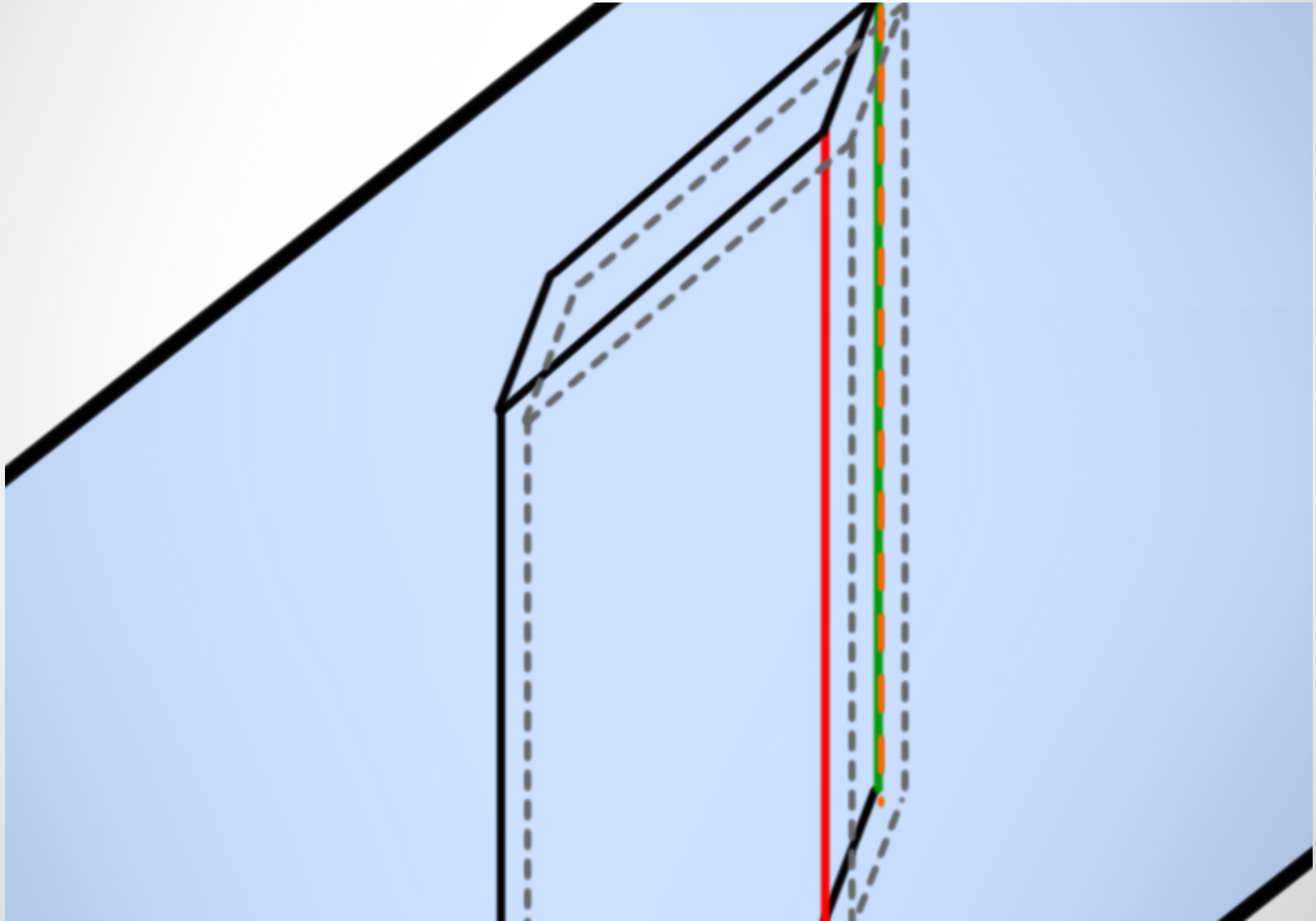
Multiplas Hipóteses



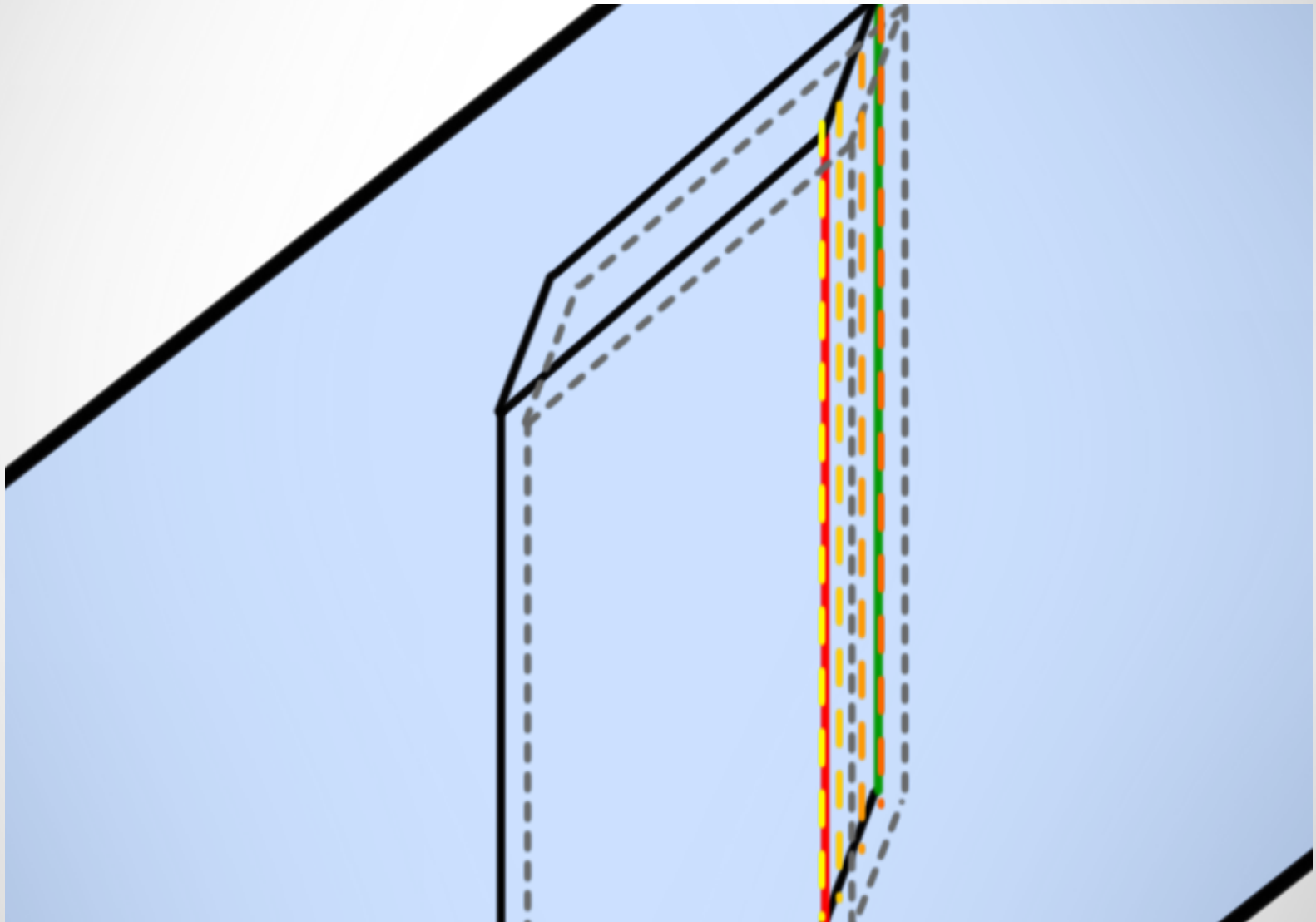
Multiplas Hipóteses

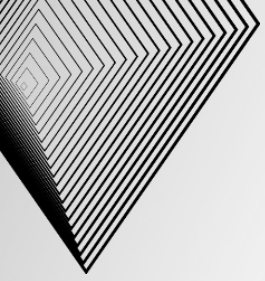


Multiplas Hipóteses



Multiplas Hipóteses





Rastreamento sem Marcadores