PROCURA EM ESPAÇOS DE ESTADOS

(PARTE 1)

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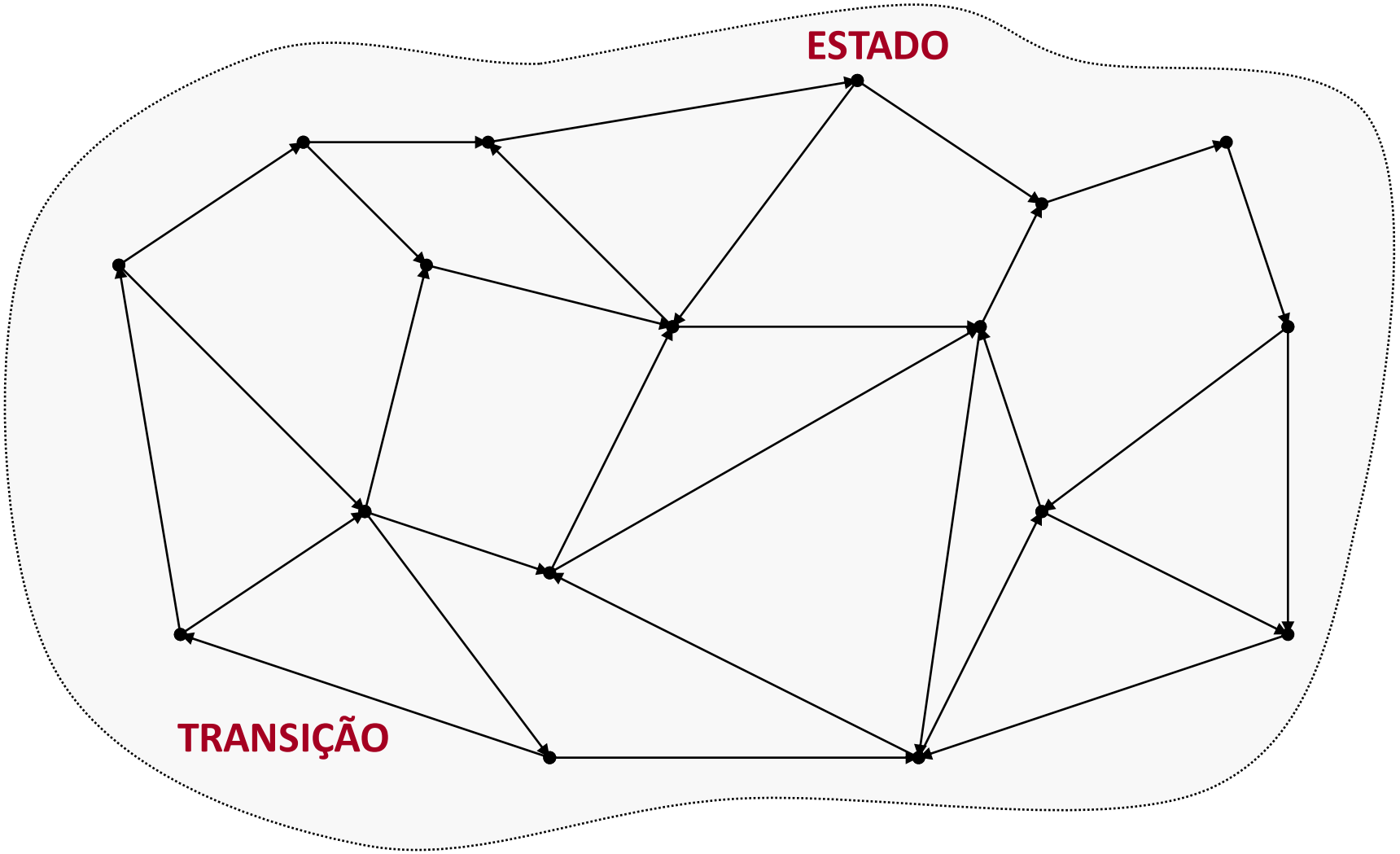
2015

ESPAÇO DE ESTADOS



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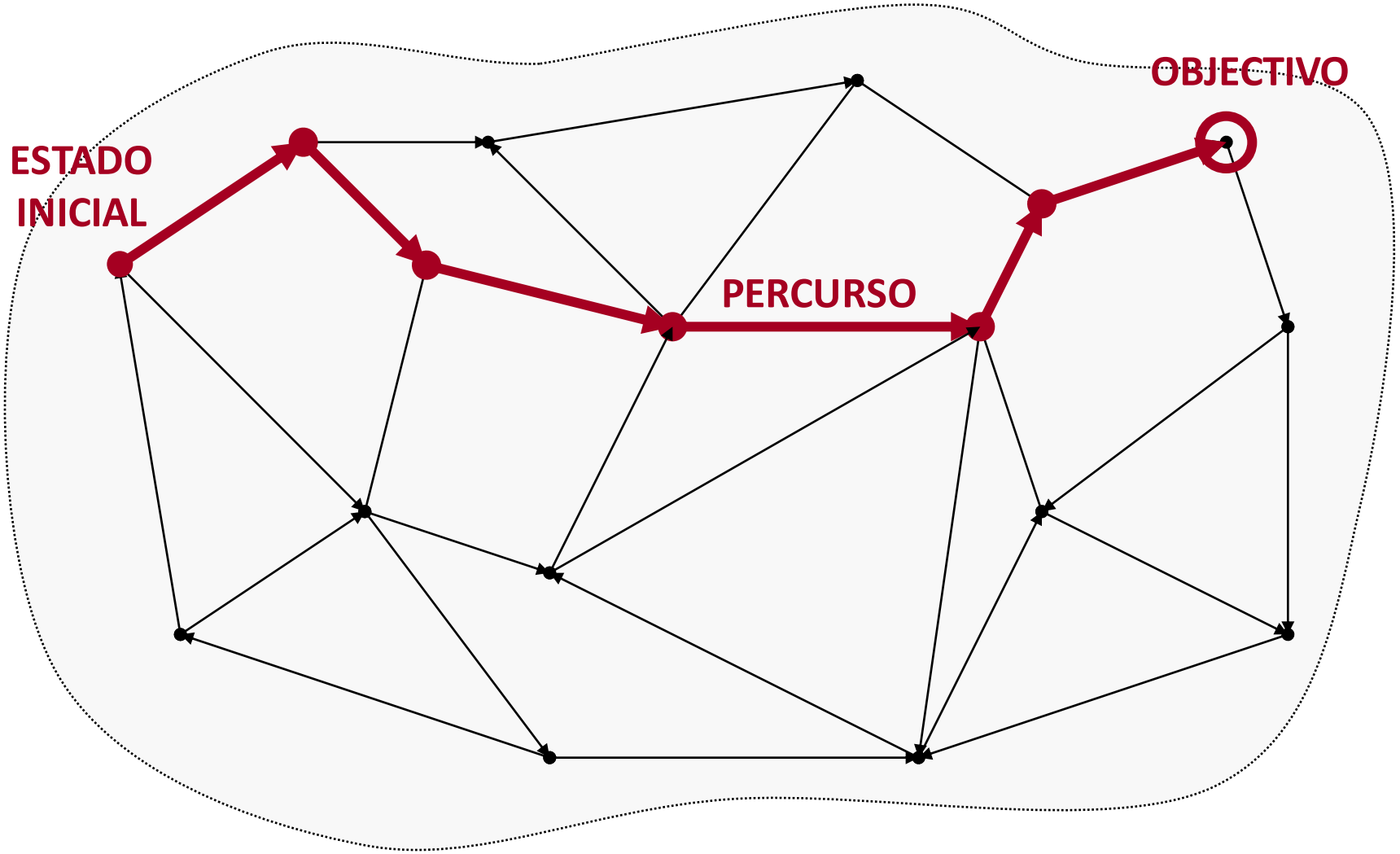

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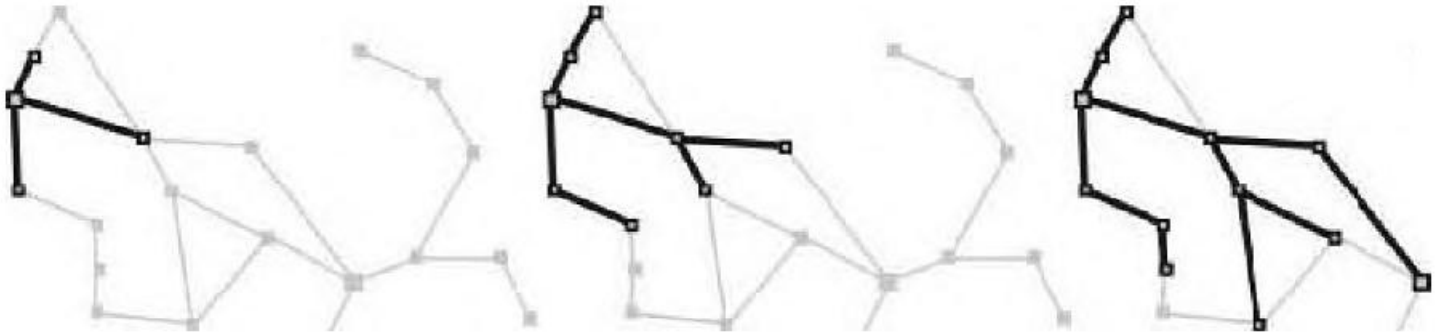
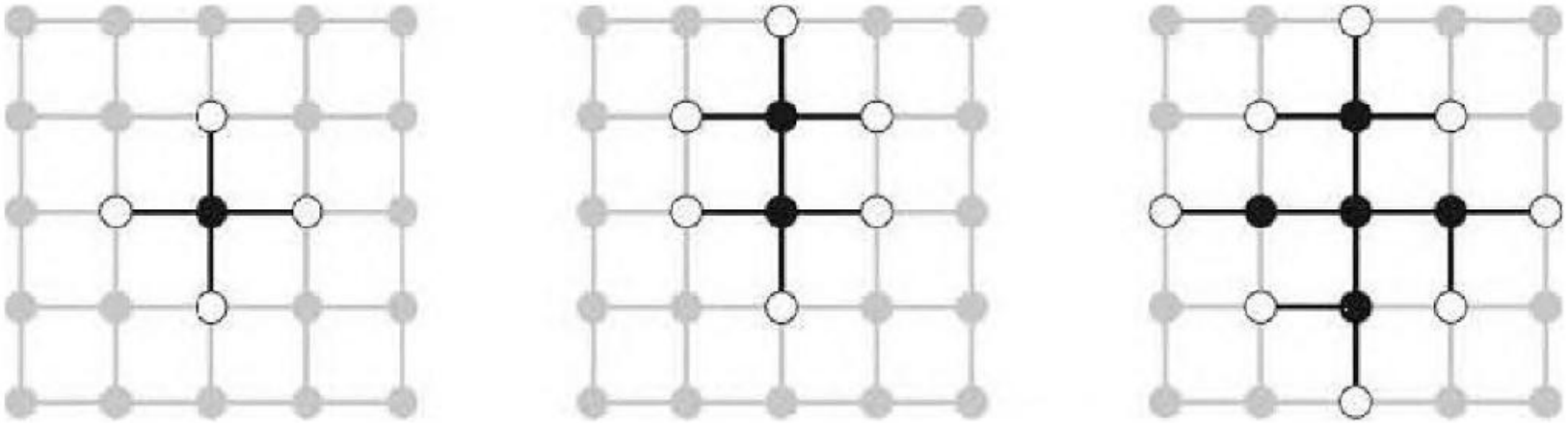
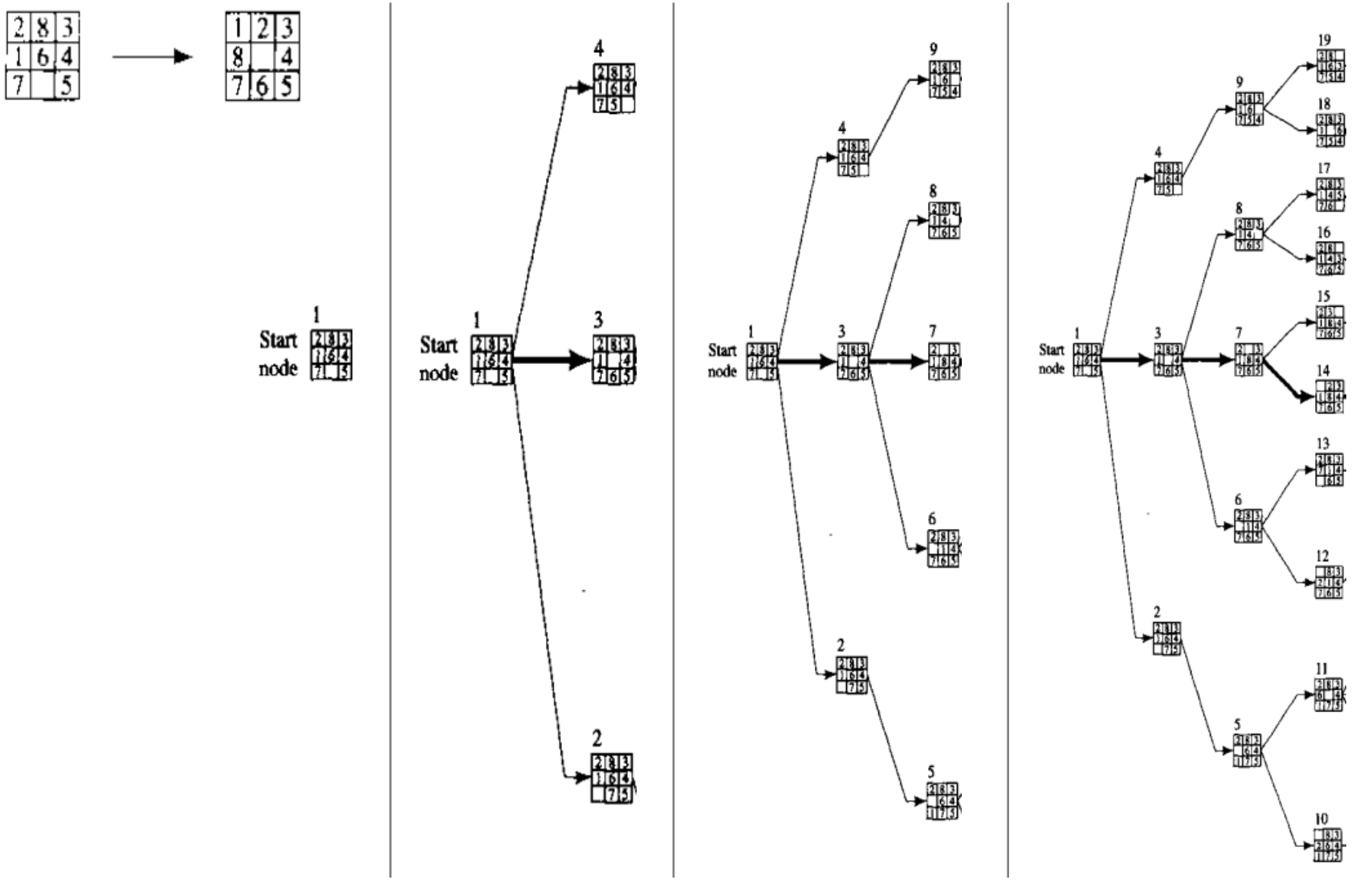




[Russel & Norvig, 2009]

PROCURA EM ESPAÇOS DE ESTADOS



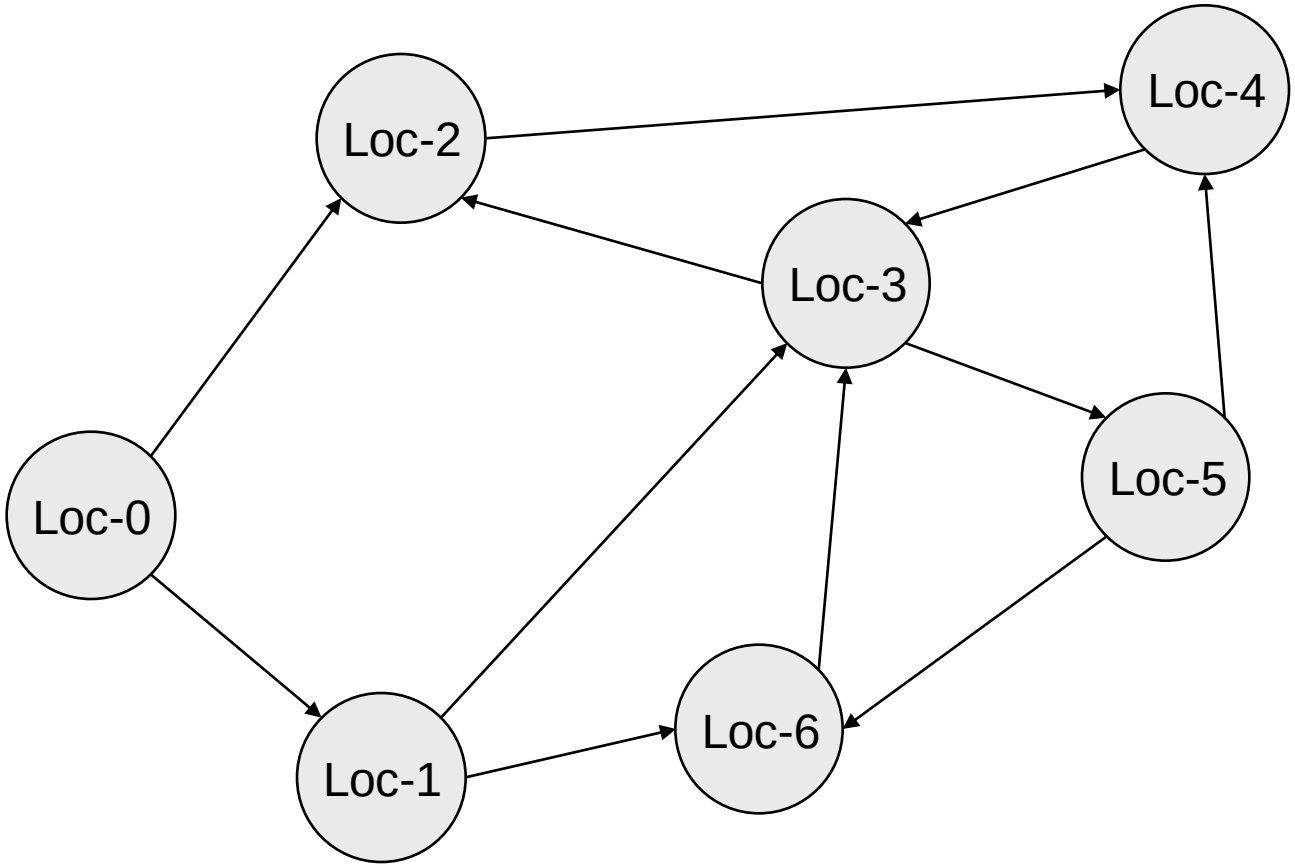
[Nilsson, 1998]

EXEMPLO: SISTEMA DE TRANSPORTES

LIGAÇÕES EXISTENTES:

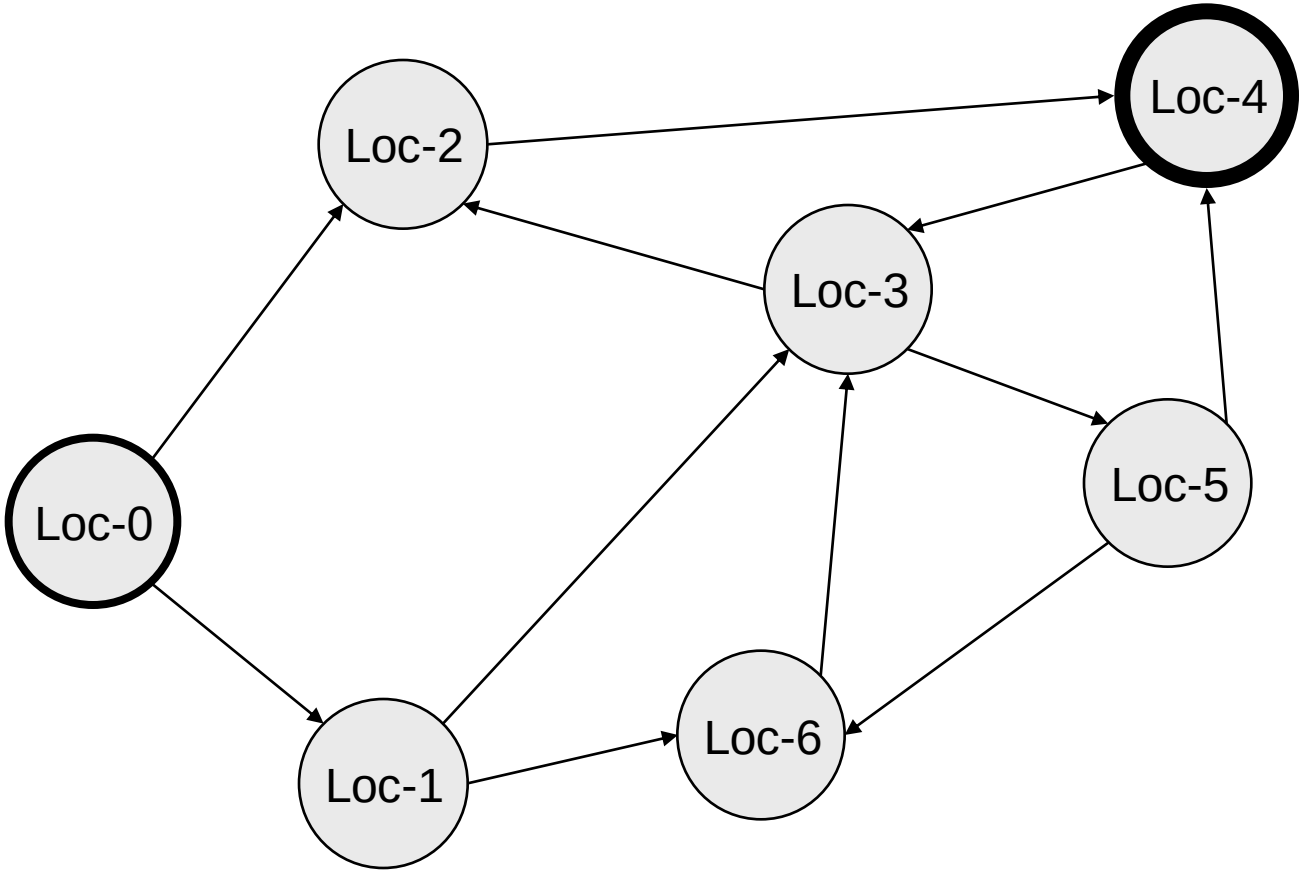
Localidade inicial	Localidade final	Custo
Loc-0	Loc-1	5
Loc-0	Loc-2	25
Loc-1	Loc-3	12
Loc-1	Loc-6	5
Loc-2	Loc-4	30
Loc-3	Loc-2	10
Loc-3	Loc-5	5
Loc-4	Loc-3	2
Loc-5	Loc-6	8
Loc-5	Loc-4	10
Loc-6	Loc-3	15

REPRESENTAÇÃO DO ESPAÇO DE ESTADOS



GRAFO DO ESPAÇO DE ESTADOS

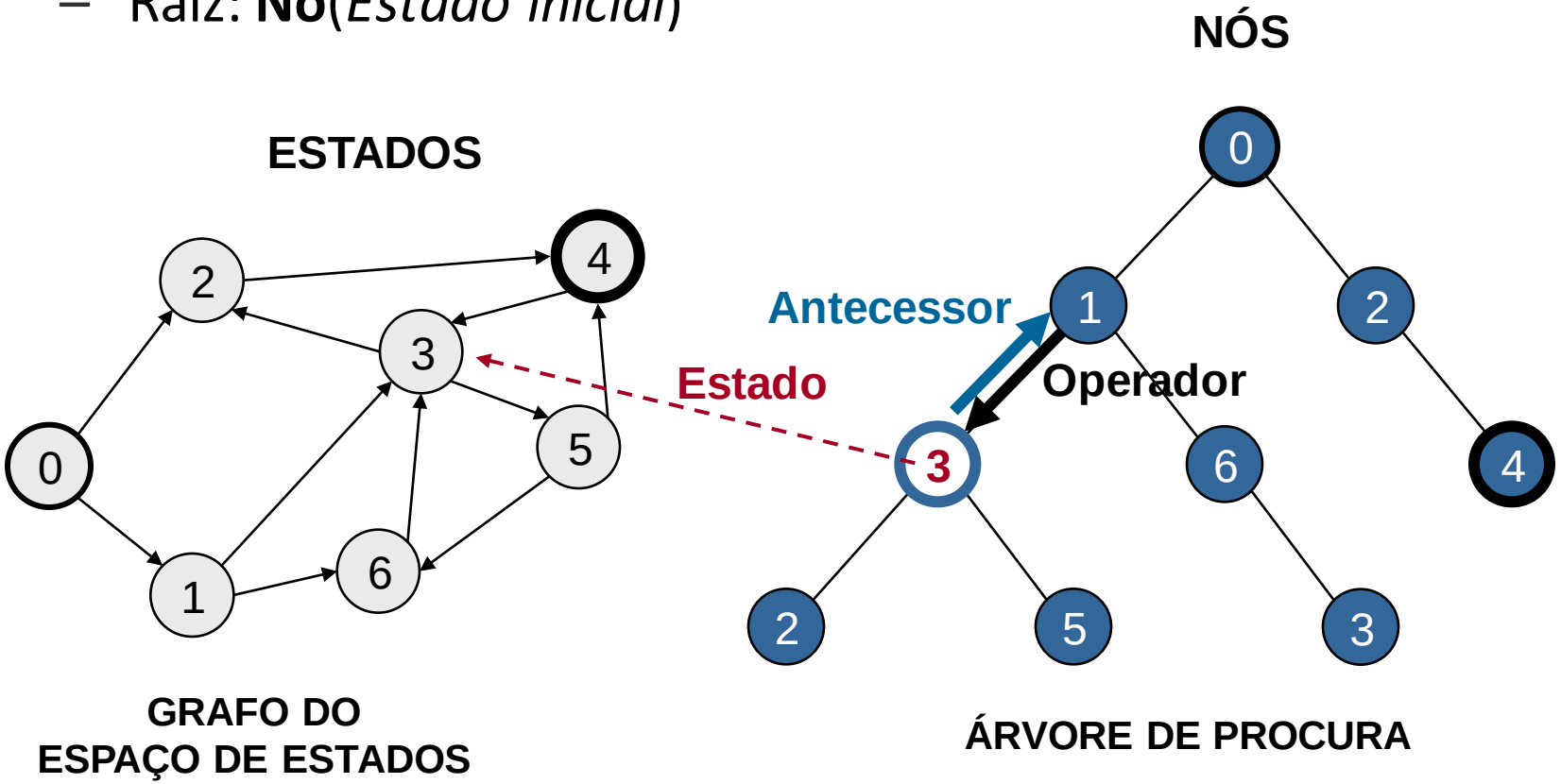
TRAJECTO ENTRE Loc-0 e Loc-4 ?



GRAFO DO ESPAÇO DE ESTADOS

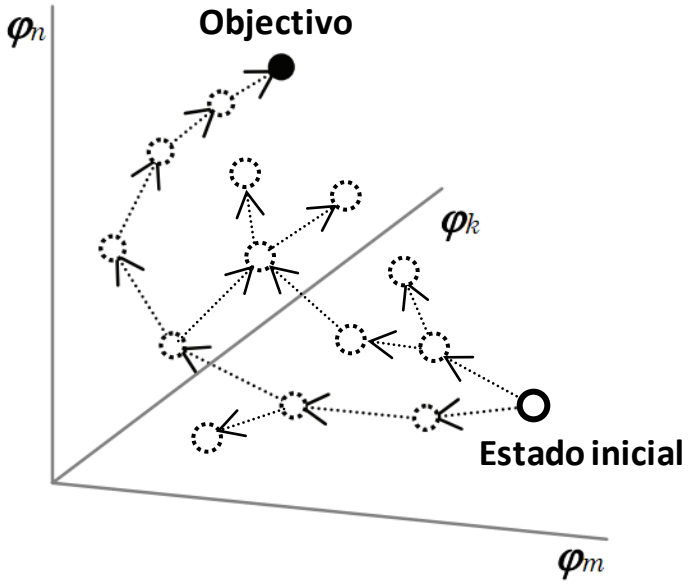
PROCESSO DE PROCURA

- Exploração sucessiva do espaço de estados
- Etapa de procura: **Nó**
- Árvore de procura
  - Raiz: **Nó**(*Estado inicial*)



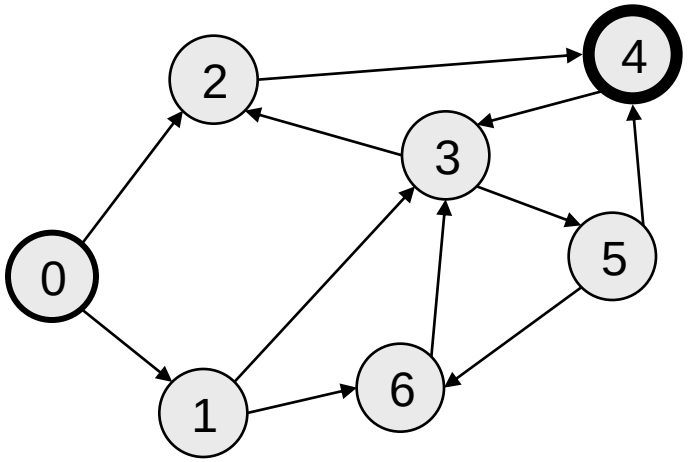
RACIOCÍNIO ATRAVÉS DE PROCURA

- **Estado**
  - Define situação
- **Operador**
  - Define transformação (**transição** de estado)
  - Custo
- **Problema**
  - Estado inicial
  - Objectivo
  - Operadores
- **Solução**
  - Percurso (**plano** de acção)

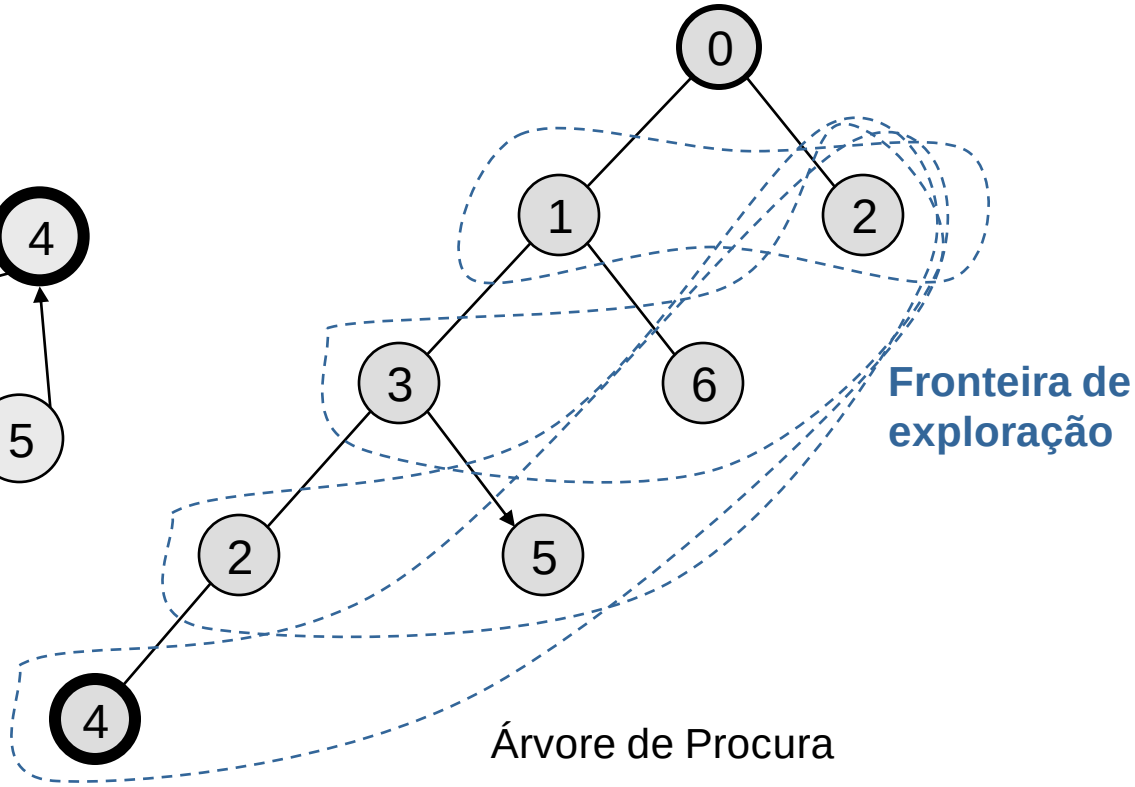


MÉTODOS DE PROCURA

- Estratégia de controlo
  - Explorar primeiro os nós mais **recentes**



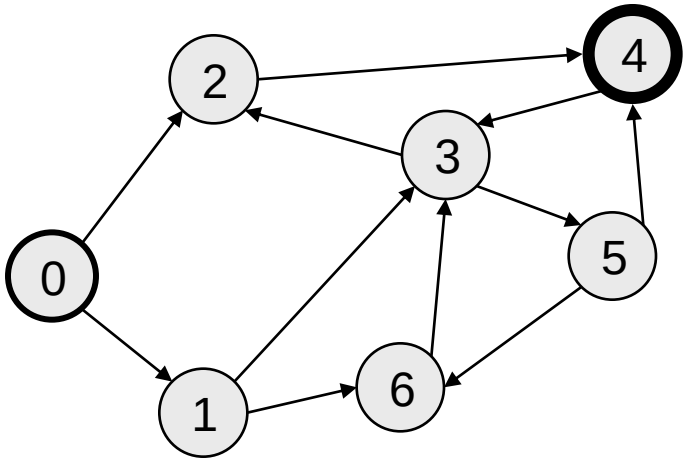
Grafo do
Espaço de Estados



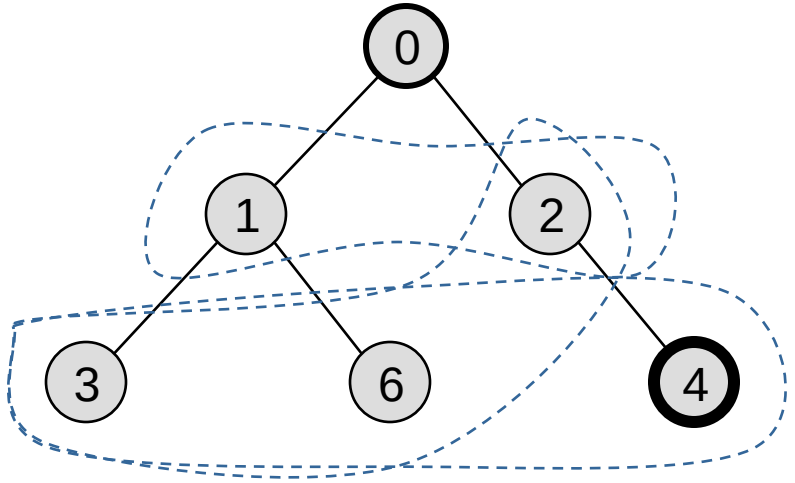
Árvore de Procura

MÉTODOS DE PROCURA

- Estratégia de controlo
  - Explorar primeiro os nós mais **antigos**



Grafo do
Espaço de Estados



Árvore de Procura

PROCURA EM ESPAÇOS DE ESTADOS

DEFINIÇÃO DO PROBLEMA

datatype PROBLEM
components: INITIAL-STATE, OPERATORS, GOAL-TEST, PATH-COST-FUNCTION

MÉTODO GERAL DE PROCURA

function GENERAL-SEARCH(*problem*, QUEUING-FN) **returns** a solution, or failure

nodes ← MAKE-QUEUE(MAKE-NODE(INITIAL-STATE[*problem*]))
loop do
  if *nodes* is empty **then return** failure
  node ← REMOVE-FRONT(*nodes*)
  if GOAL-TEST[*problem*] applied to STATE(*node*) succeeds **then return** *node*
  nodes ← QUEUING-FN(*nodes*, EXPAND(*node*, OPERATORS[*problem*]))
end

Figure 3.10 The general search algorithm. (Note that QUEUING-FN is a variable whose value will be a function.)

[Russel & Norvig, 2003]

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