UTEC
UNIVERSIDAD DE INGENIERÍA Y TECNOLOGÍA

Sesión 11.0: Espacio métrico

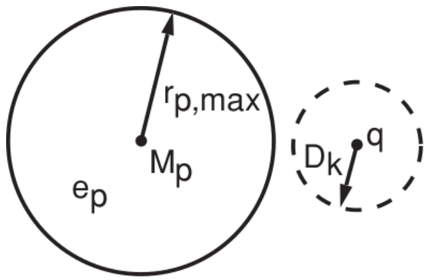
CS3102 EDA

Índice

1. Depth-First
K-Nearest Neighbor

Depth-First *K-Nearest Neighbor*

Reglas 1 Nodo interno

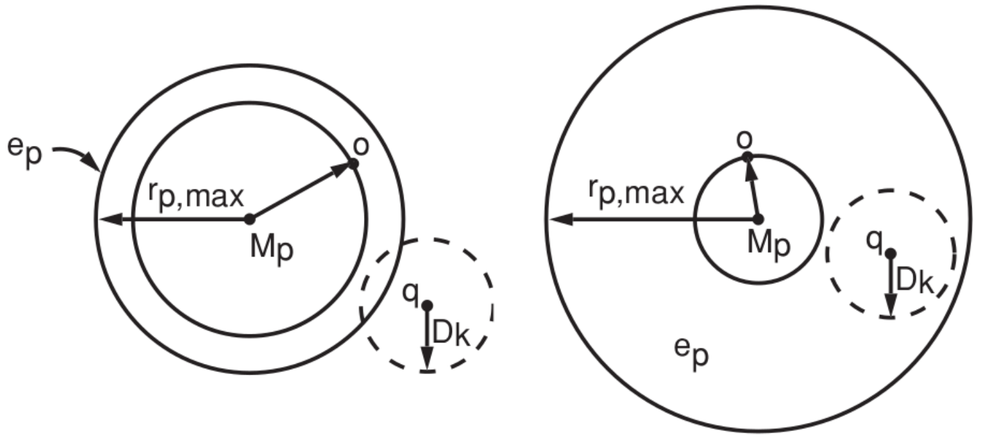


Círculo de Búsqueda

Omitir si: $D_k + r_{p,max} < d(q, M_p)$

Descartar **nodos internos**

Reglas 2 Nodo hoja

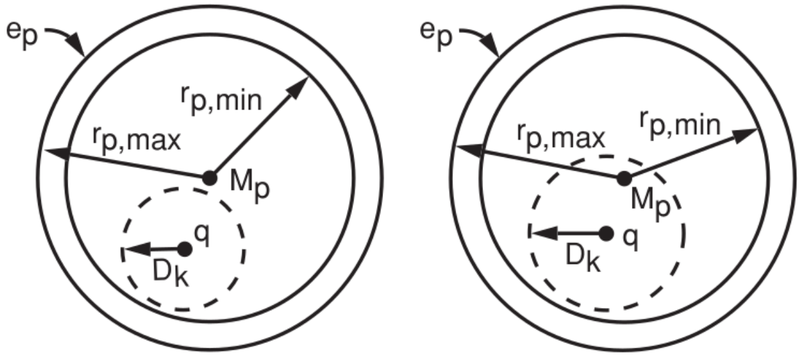


Omitir si: $D_k + d(o, M_p) < d(q, M_p)$

Descartar **puntos**

Depth-First *K-Nearest Neighbor*

Reglas 3 Nodo interno

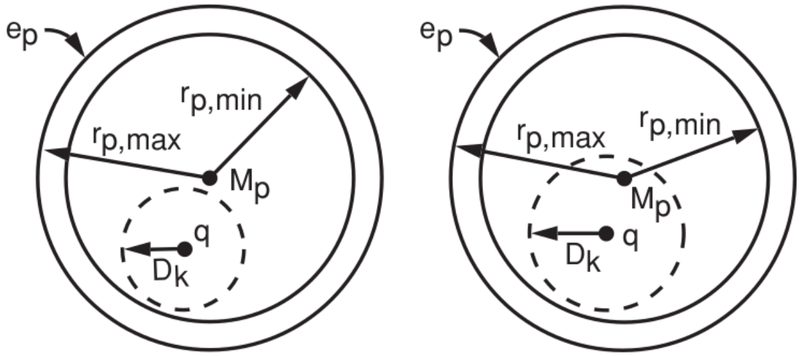


Omitir si: $D_k + d(q, M_p) < r_{p,min}$

Descartar **nodos internos**

Depth-First *K-Nearest Neighbor*

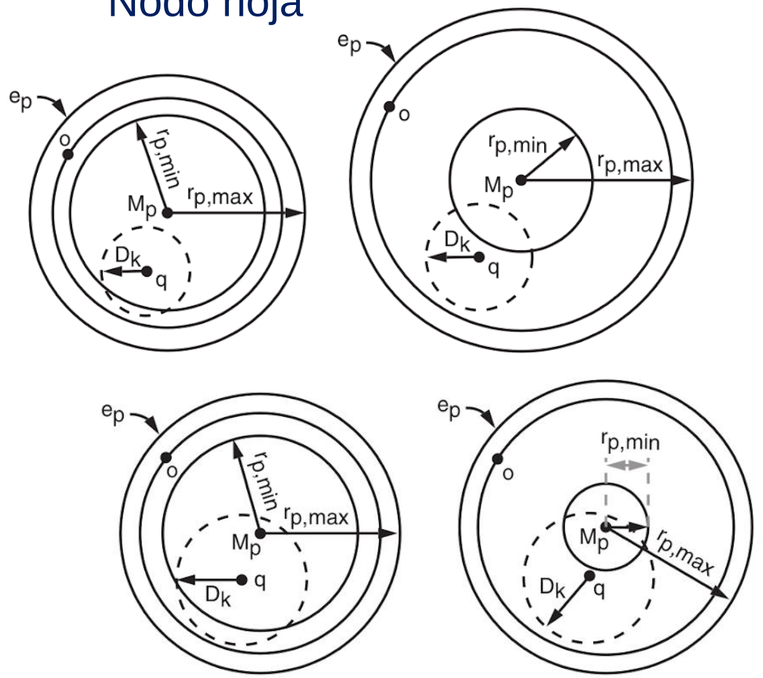
Reglas 3 Nodo interno



Omitir si: $D_k + d(q, M_p) < r_{p,min}$

Descartar **nodos internos**

Reglas 4 Nodo hoja

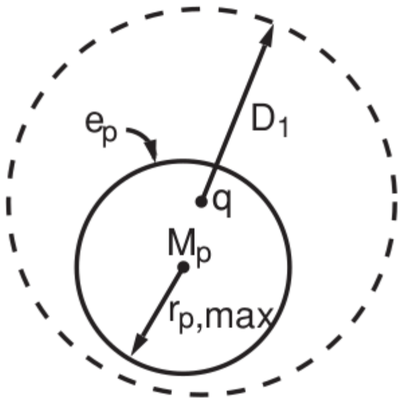


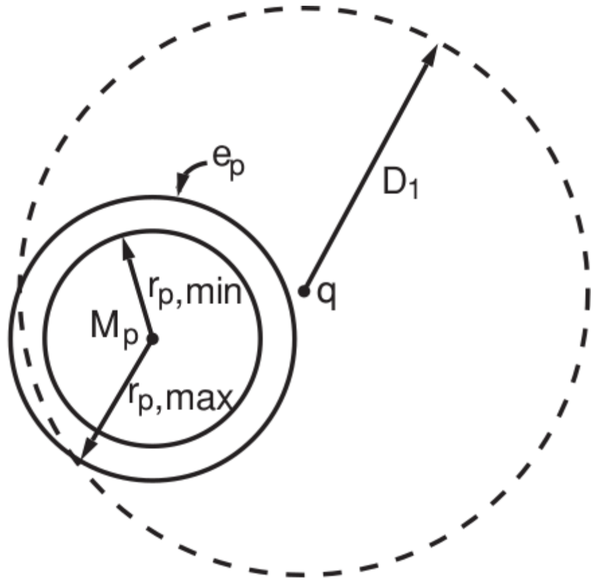
Omitir si: $D_k + d(q, M_p) < d(o, M_p)$

Descartar **puntos**

Depth-First *K-Nearest Neighbor*

Reglas 5 Nodo interno **Solo para k=1**





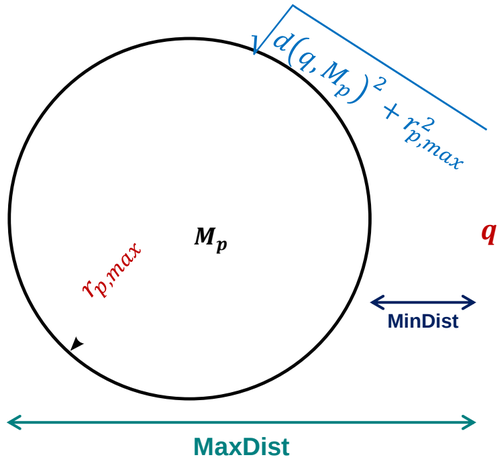
Si: $d(q, M_p) + r_{p,min} < D_1$ Actualizar a: $D_1 = d(q, M_p) + r_{p,min}$

Actualiza D_k al examinar **nodos**

Depth-First *K-Nearest Neighbor*

Reglas 5: Mejora

Si $r_{p,min}$ no está definida



Depth-First *K-Nearest Neighbor*

Reglas 5: Mejora

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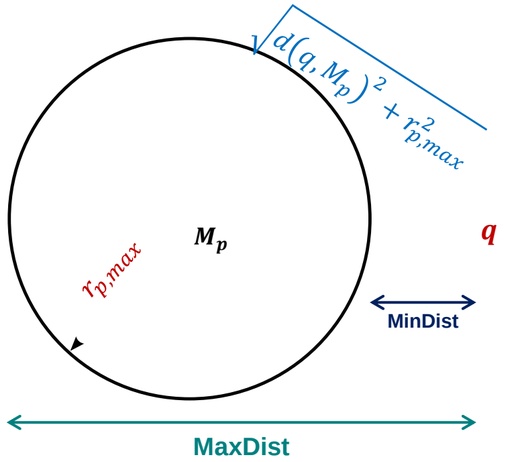
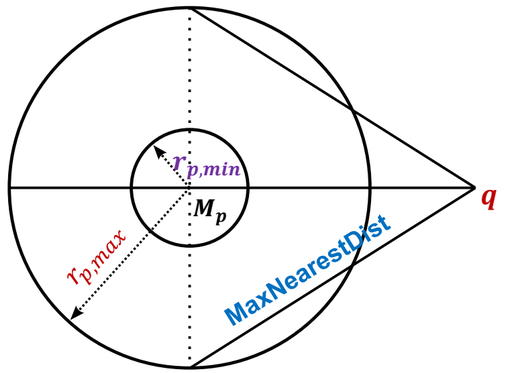


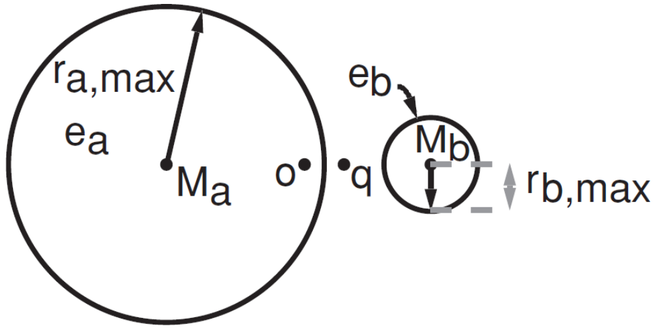
Si $r_{p,min}$ está definida



Depth-First *K-Nearest Neighbor*

Lista Activa

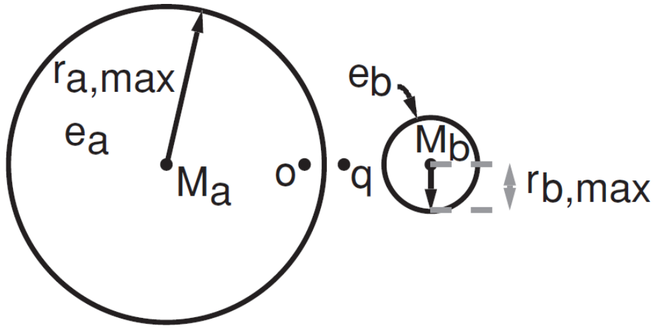
Ordenar la lista activa con respecto a la mediana no siempre es la mejor opción.



Depth-First *K-Nearest Neighbor*

Lista Activa

Ordenar la lista activa con respecto a la mediana no siempre es la mejor opción.

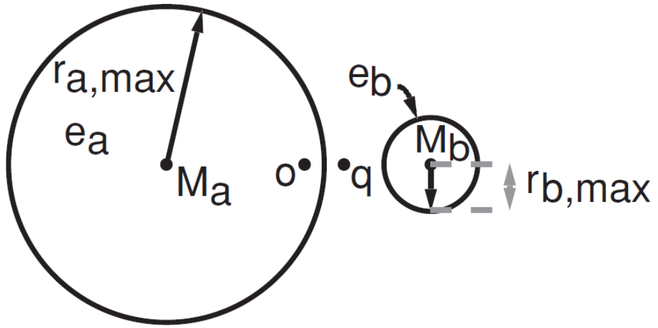


Podríamos usar: **MinDistObject** **MaxDistObject**

Depth-First *K-Nearest Neighbor*

Lista Activa

Ordenar la lista activa con respecto a la mediana no siempre es la mejor opción.

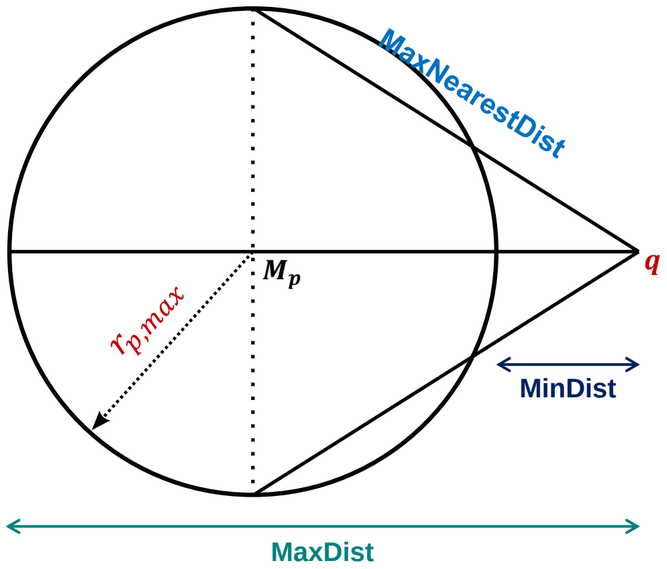


Podríamos usar: **MinDistObject** **MaxDistObject**

Es muy costoso!
Se examinan todos los puntos

Depth-First *K-Nearest Neighbor*

Lista Activa



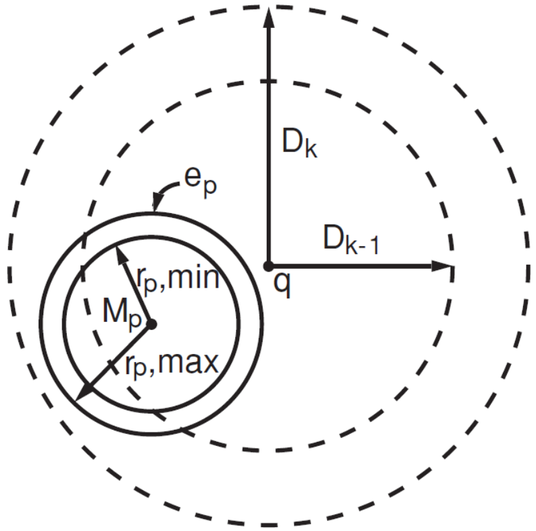
Depth-First *K-Nearest Neighbor*

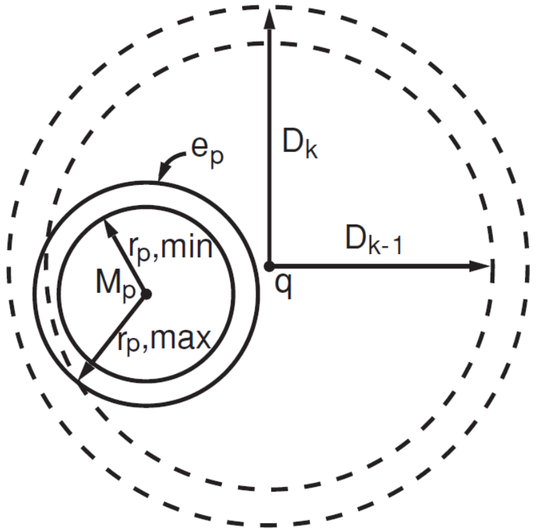
Max-nearest depth-first k-Nearest Neighbor algorithm

$$\text{MinDist}(q, e_p) = \begin{cases} r_{p,min} - d(q, M_p), & 0 \le d(q, M_p) \le r_{p,min} \\ 0, & r_{p,min} \le d(q, M_p) \le r_{p,max} \\ d(q, M_p) - r_{p,max}, & r_{p,max} \le d(q, M_p) \end{cases}$$

Depth-First *K-Nearest Neighbor*

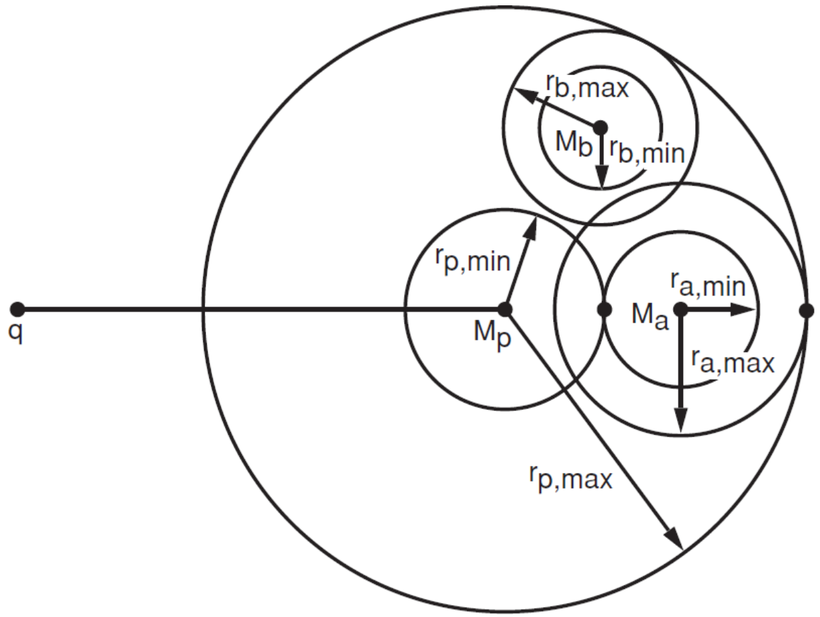
Max-nearest depth-first k-Nearest Neighbor algorithm





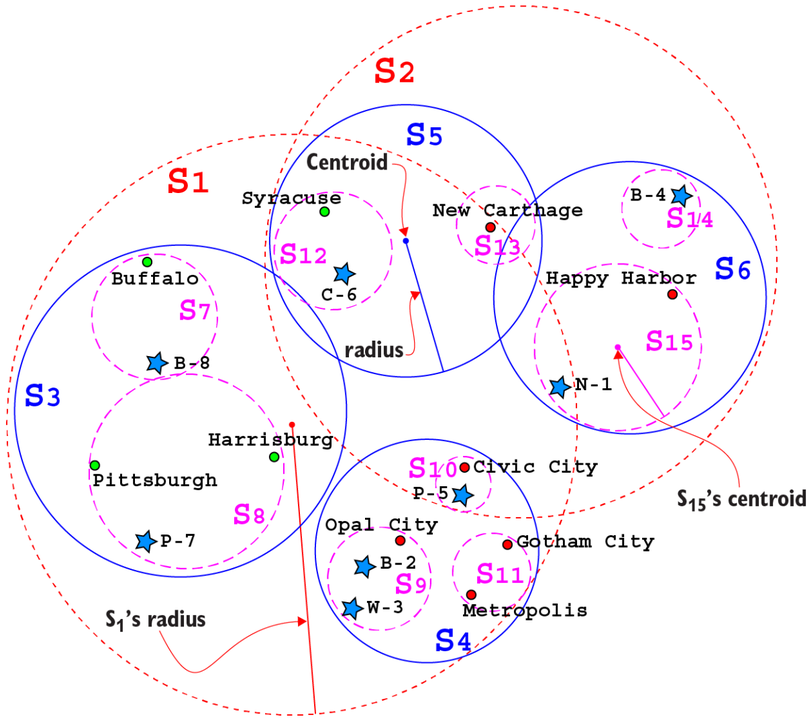
Depth-First *K-Nearest Neighbor*

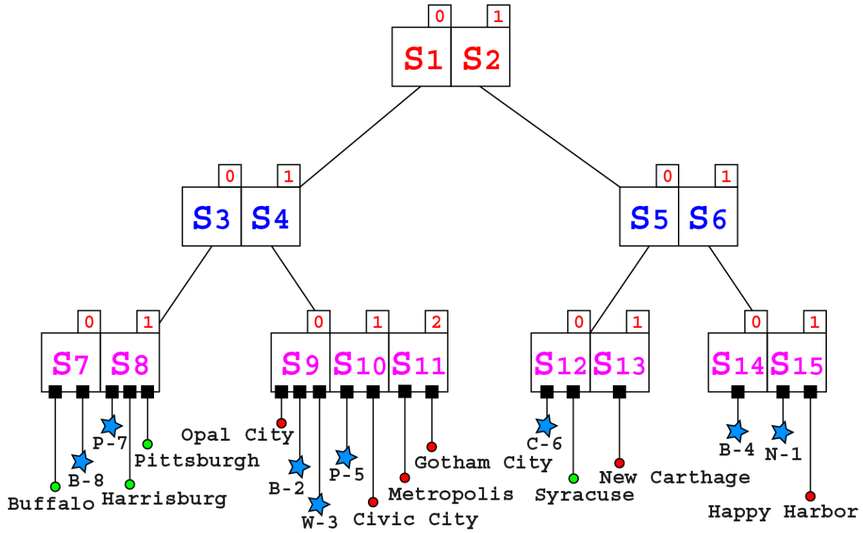
Max-nearest depth-first k-Nearest Neighbor algorithm



2. ss-Tree

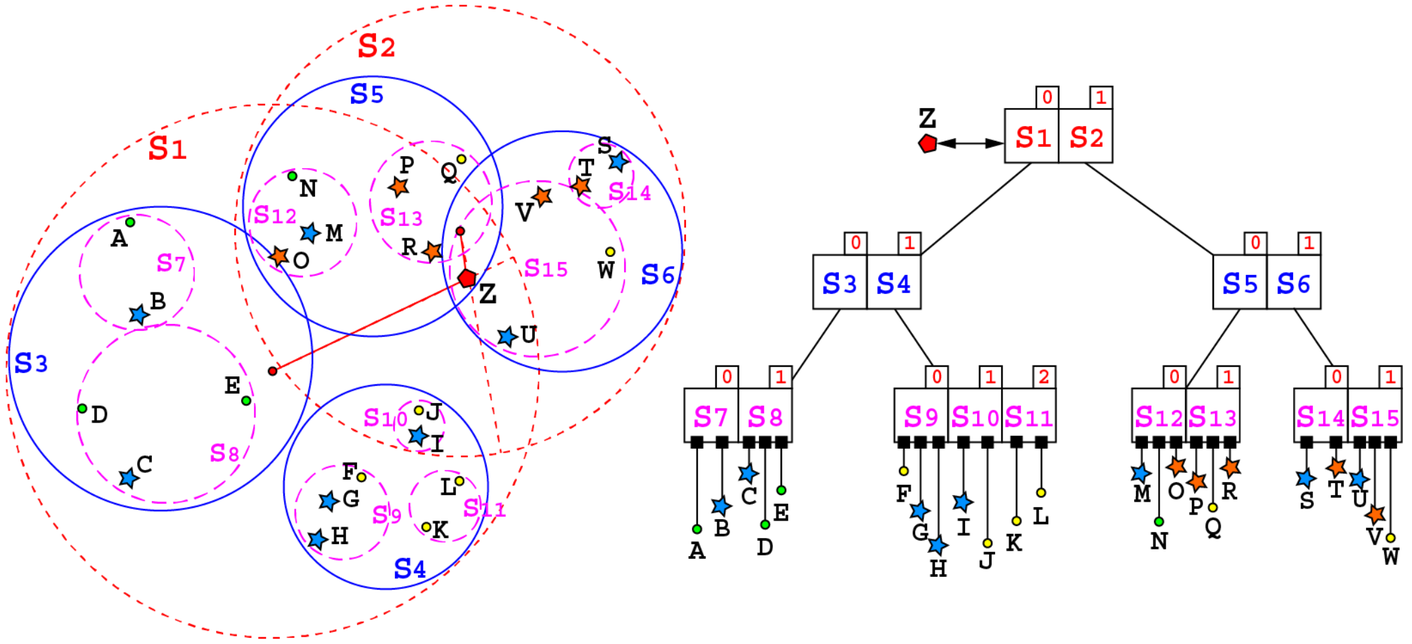
SS-*Tree*


S2
S5
S1
Centroid
Syracuse
New Carthage
B-4
S14
S12
S13
S6
C-6
Buffalo
Happy Harbor
S7
S15
radius
B-8
N-1
S3
Harrisburg
S10
Civic City
Pittsburgh
P-5
S15's centroid
S8
Opal City
Gotham City
P-7
B-2
S9
S11
W-3
Metropolis
S1's radius
S4


0 1
S1 S2
0 1
S3 S4
0 1
S5 S6
0 1
S7 S8
0 1 2
S9 S10 S11
0 1
S12 S13
0 1
S14 S15
P-7
Opal City
C-6
B-4
N-1
B-8
Pittsburgh
B-2
P-5
Gotham City
Buffalo
Harrisburg
Metropolis
Syracuse
New Carthage
W-3
Civic City
Happy Harbor

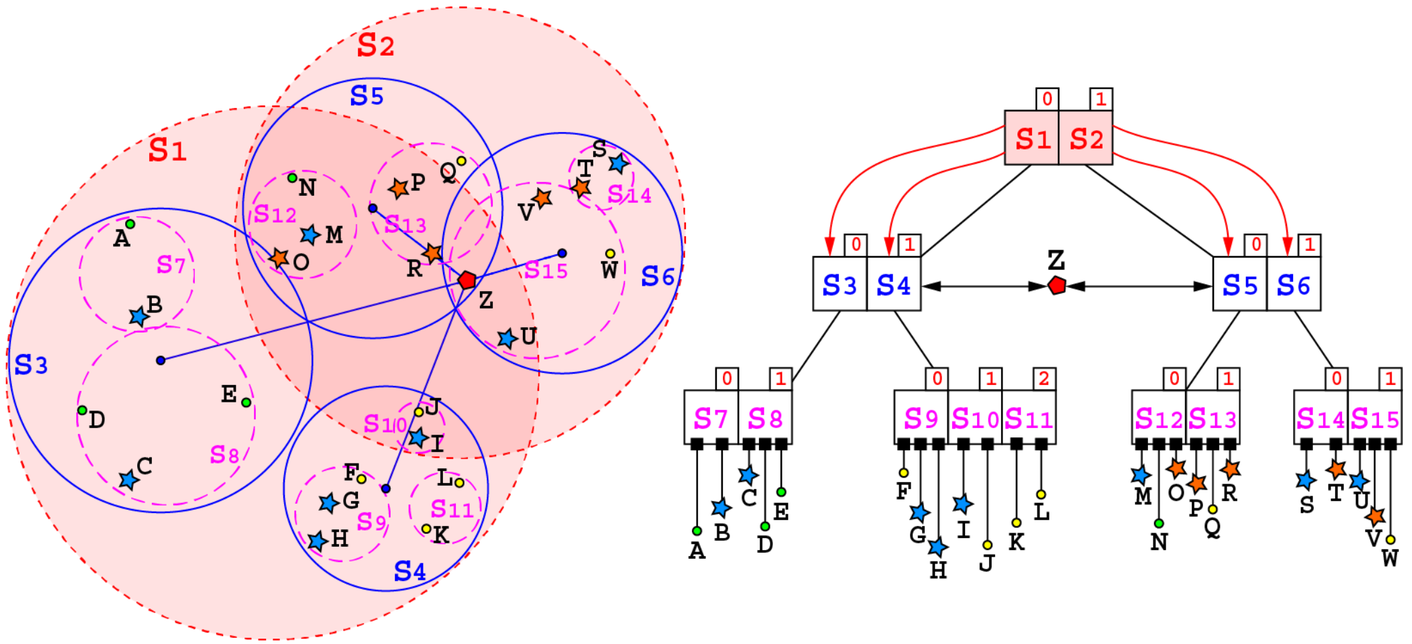
SS-*Tree*

Búsqueda



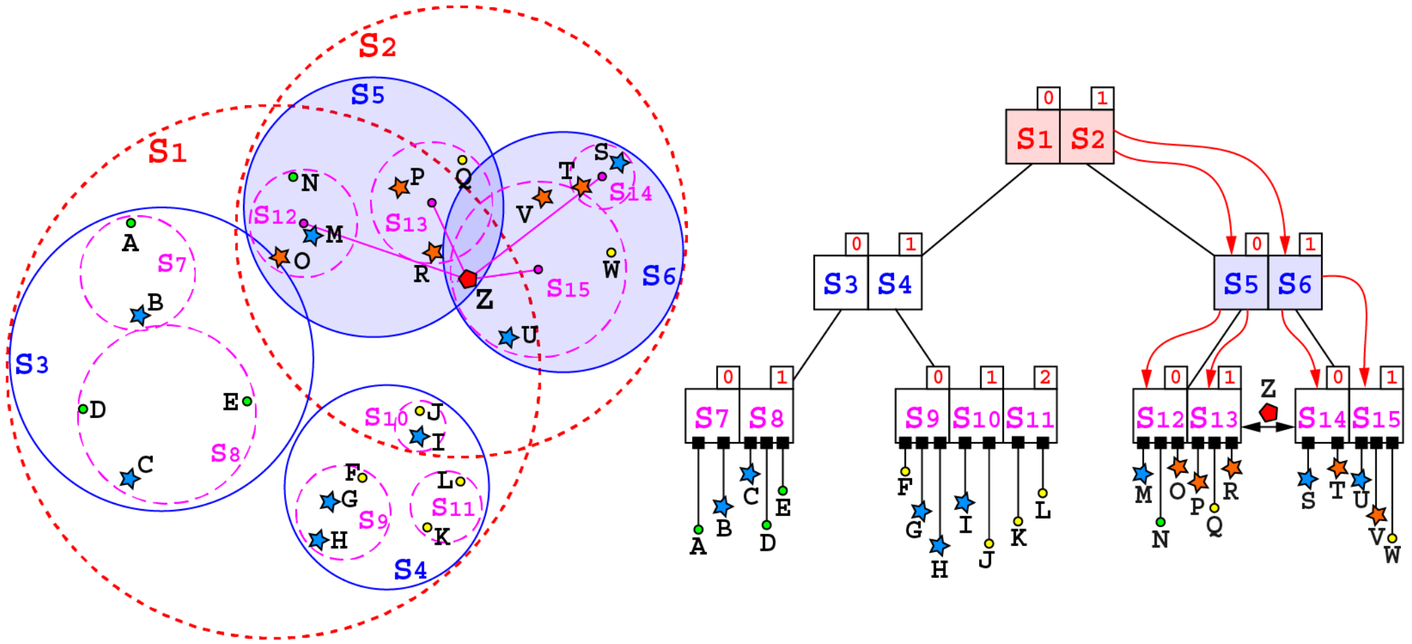
SS-*Tree*

Búsqueda



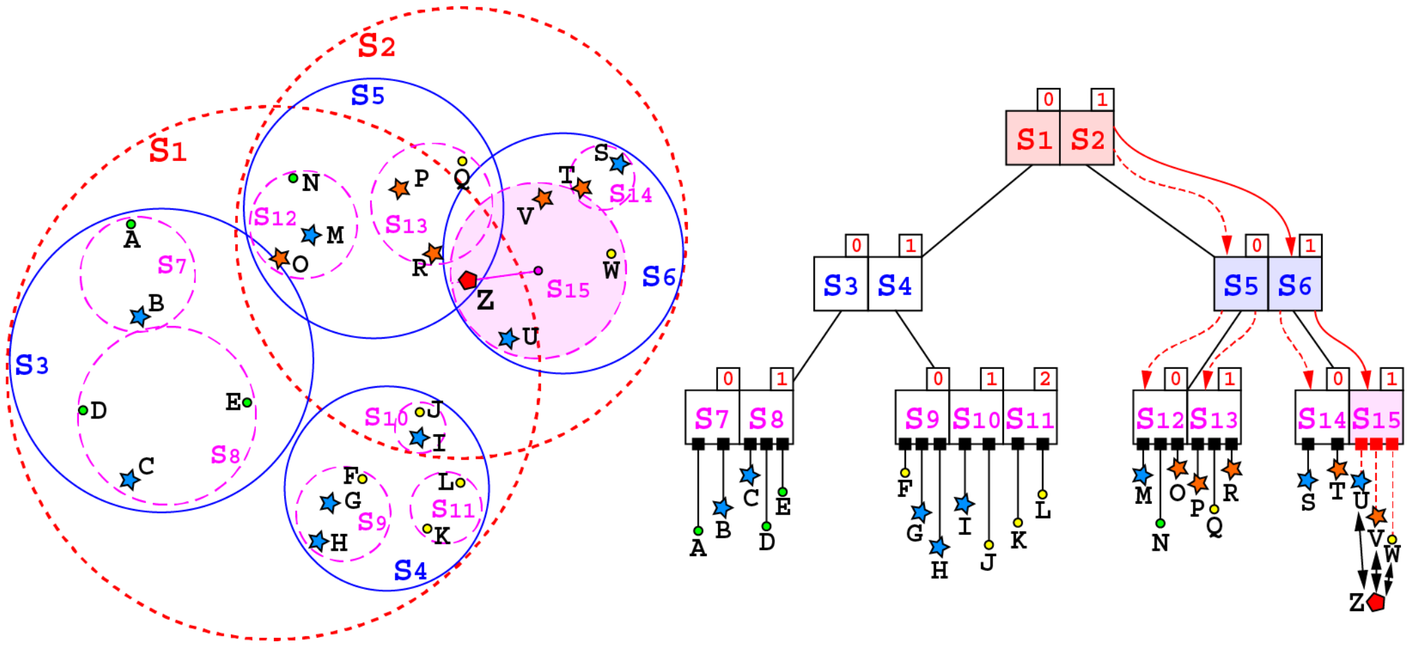
SS-*Tree*

Búsqueda



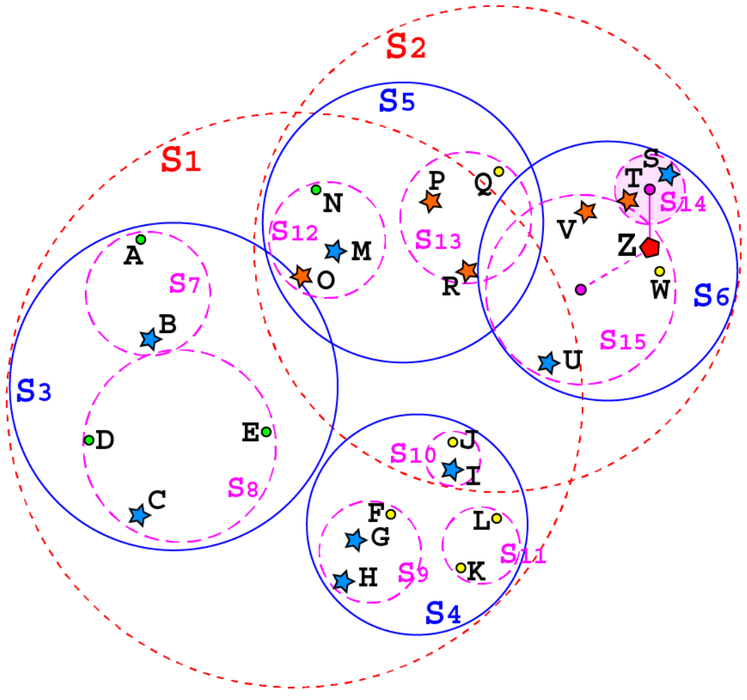
SS-*Tree*

Búsqueda



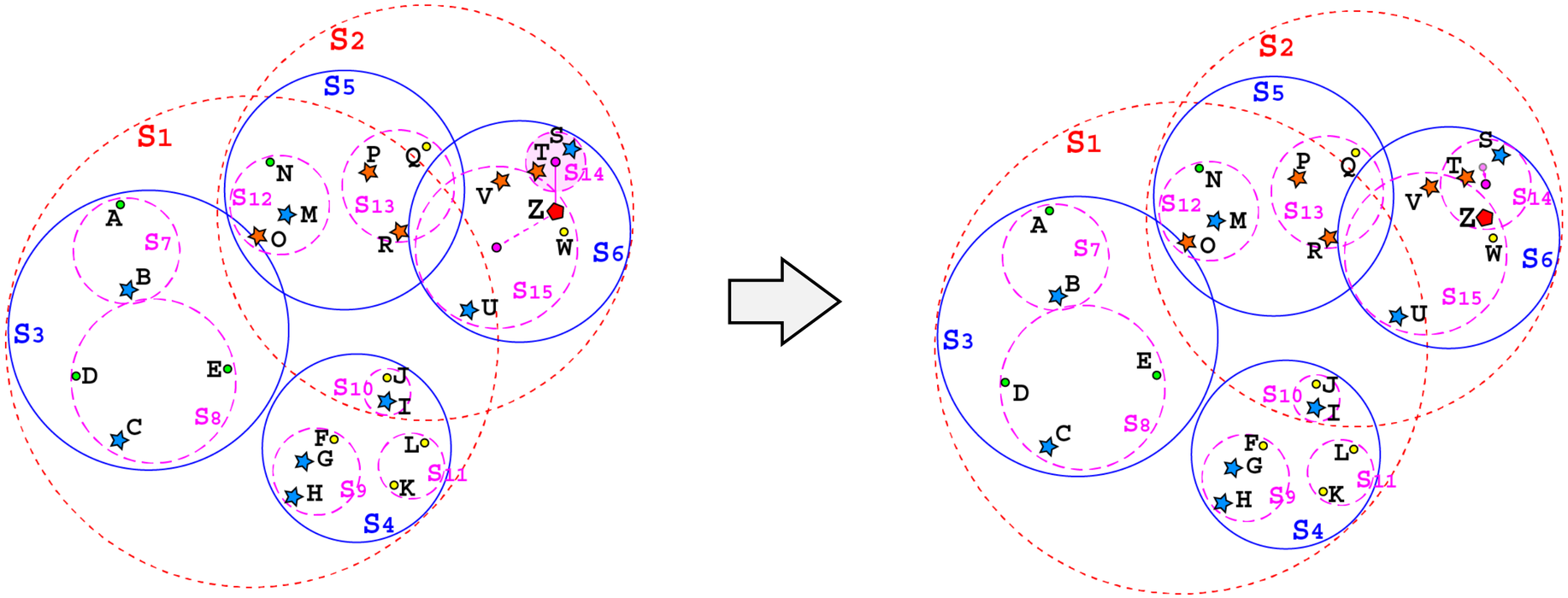
SS-*Tree*

Inserción



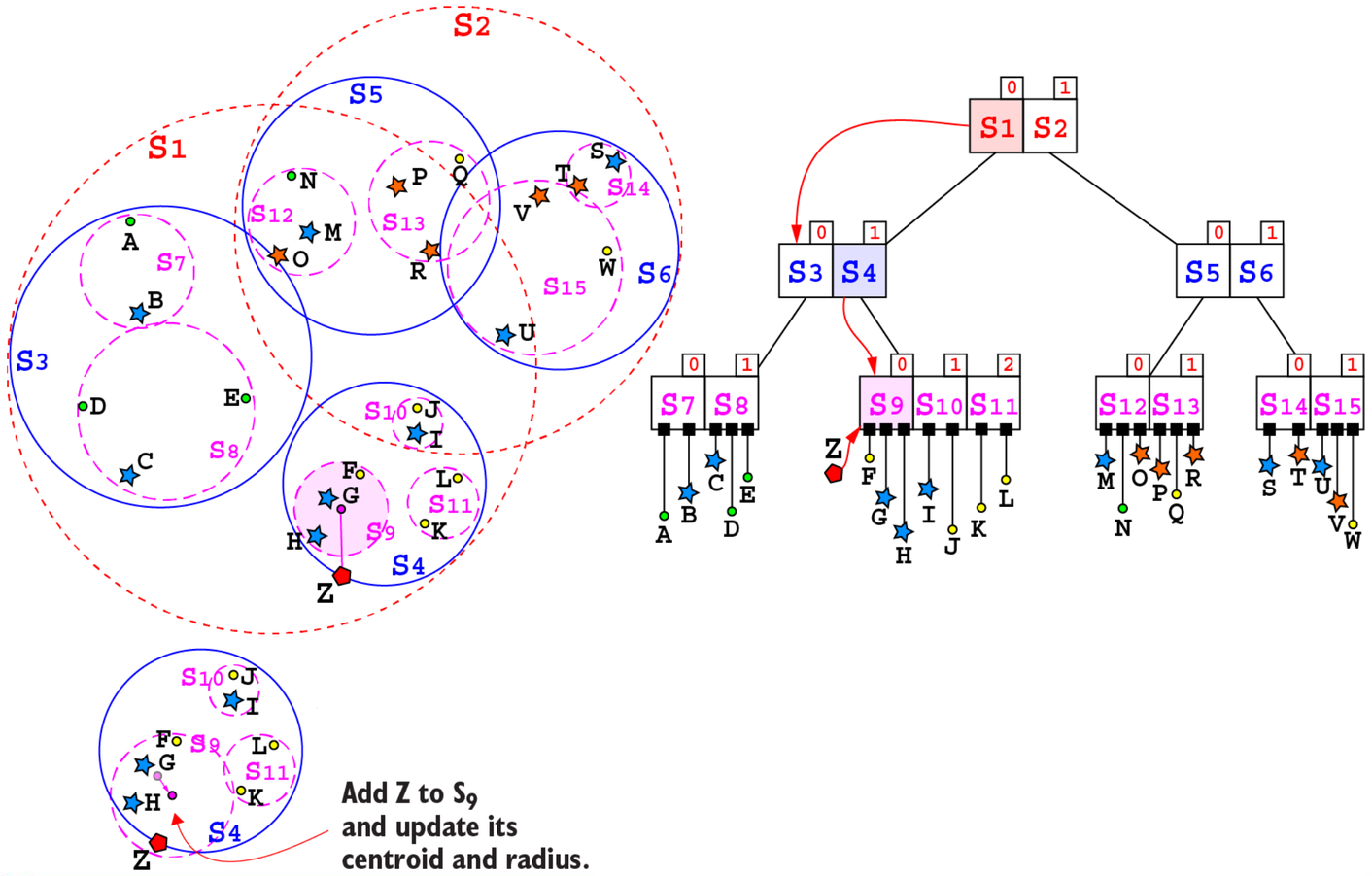
SS-*Tree*

Inserción



SS-*Tree*

División



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