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**Algorithm 2:** Filter out disks which are subsets

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1 Algorithm FilterCandidates( $\mathcal{B}$ )
   Input:  $\mathcal{B}$ : active boxes of timestamp  $t_i$ , sorted by x-axis values
   Output:  $\mathcal{C}$ : final set of disks for timestamp  $t_i$ 
2    $\mathcal{C} \leftarrow \emptyset$ 
3   for  $j \leftarrow 0$  to  $j \leq |\mathcal{B}|$  do
4     for  $k \leftarrow j + 1$  to  $k \leq |\mathcal{B}|$  do
5       if IntersectsWith( $\mathcal{B}[j]$ ,  $\mathcal{B}[k]$ ) then
6         foreach  $c \in \mathcal{B}[j].disks$  do
7            $\mathcal{C} \leftarrow \text{InsertDisk}(\mathcal{C}, c)$ 
8         else // No intersection.
9           break
10 Procedure InsertDisk( $\mathcal{C}, c$ )
   Input:  $\mathcal{C}$ : set of disks,  $c$ : new disk
11   foreach  $d \in \mathcal{C}$  do
12     if  $c.sign \wedge d.sign = c.sign \ \&\& \ dist(c, d) \leq \epsilon$  then //  $c$  can be a subset of  $d$ 
13       if  $d \cap c = c$  then // Remove chance of false-positive
14         return  $\mathcal{C}$  // No need to insert  $c$ 
15     else if  $c.sign \wedge d.sign = d.sign$  then //  $d$  can be a subset of  $c$ 
16       if  $c \cap d = d$  then // Remove chance of false-positive
17          $\mathcal{C} \leftarrow \mathcal{C} \setminus d$  // Remove  $d$ 
18   return  $\mathcal{C} \cup c$ 
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