



The PC Structure, a modification of the SGS algorithm works as follows:

1. Start with a complete, undirected graph on all variables, with edges between all nodes.
2. Given every set of all variables  $(X, Y)$ , see if  $X$  is independent of  $Y$ . If so, remove the edges between the two.
3. For each  $X$  and  $Y$  which are still connected, each of the remaining variables (every  $s$  in set  $S$ ), see if  $X$  is independent of  $Y$  given  $s$ . If so, remove the edge between  $X$  and  $Y$ .
4. For the remaining variables, identify any colliders. For example,  $X$  is dependent of  $Y$ , and  $Y$  is dependent of  $Z$ , but  $X$  and  $Z$  are independent given variable  $W$ , not containing  $Y$ , then this can be represented by the structure  $X \rightarrow Y \leftarrow Z$ .
5. Using the conditional relationships provided by the remaining variables and colliders, orient the edges.
6. A directed acyclic graph is created by randomly orienting the remaining edges.

Not every link will be discoverable and identified because pure data cannot indicate wherever there is a collider.