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| Improved Distributed PCA Detection |
| 1. letbe the max projection distance from the first pc of node; |
| 2. letbe the median projection distance of ’s neighboring nodes’;(is the group head node of ) |
| 3. letbe the median projection distance of the set ; |
| 4. letbe the amount of data measurements for learning theand first pc; |
| 5. letbe a new data measurement arrive at ; |
| 6. letbe the new data measurements arriving at’s neighboring nodes at the same time interval |
| 7. let be the projection distance from the first pc at node in time windows t; |
| 8. let  be the median projection distance offrom their own first pc in time windows t; |
| 9. procedure learning and first pc  ①each node collects  data measurements for learning its own first pc and compute, then broadcasts the distance information to its group node ;  ②each group node then computesand ;  ③initiate IsOutlier(,) for each node;  return; |
| 10. procedure IsOutlier(,) for  when arrives at  computes ;  if (>&>)  indicates an outlier;  SourceOfOutlier(,,,) for;  else  indicates a normal one;  endif  return; |
| 11. procedure SourceOfOutlier(,,,);  ①collects the projection distance from its neighbor respectfully and compute the median projection distance;  ②if (>&&>)  if (>&&>)  may indicates an event;  else  may indicates an erroneous data measurement;  endif;  else  may indicates an erroneous data measurement;  endif;  return; |
| 12. procedure Updating global maximum Projection distance using the newly m time windows |