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Data Mining Approach for Clean Room Trend Tracking and Conditional Monitoring

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Abstract— Cleanroom monitoring is an ongoing process. Continuously monitoring the air quality ensures the filtration system is working properly and that no unknown particle generators exist. It is seldom useful to know how many particles are in a room; it is more useful to know if the room's contamination is increasing or decreasing over time. This is called trend tracking or change detection, and particle counters provide detailed particle contamination trend analysis. Therefore, timely and accurate change detection of environmental factors in a clean room is extremely important for understanding relationships and interactions among equipment, process, room structure and human activity in order to control particles which are the predominant sources of defects.

In this work, we developed a mixture procedure for multisensory systems to monitor data streams for a change-point that causes a gradual degradation to a subset of the streams. When a number of sensors measure different attributes of the same situation fusion across domains. In addition to multisensory data fusion, the integration of non-stationary spatial and temporal sensor-based data plus real-time surveillance systems in dynamic environment necessitate us to design a learning algorithm that models the underlying processes must be able to track these behaviors and adapt the decision models accordingly.

Index Terms— Change detection, Clean room, Data mining technique, Data stream, Particle counter, Sensor data