Trends and Recent Advances of Industrial Big Data Analytics and Cyber Physical Systems for PHM Applications

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ABSTRACT

In today's competitive business environment, companies are facing challenges in dealing with big data issues for rapid decision making for improved productivity and business innovation. Many product and manufacturing systems are not ready to manage big data due to the lack of smart analytics tools. U.S. has been driving the Cyber Physical Systems (CPS), Industrial Internet, and Advanced Manufacturing Partnership (AMP) Program to advance future manufacturing. Germany is leading a transformation toward 4th Generation Industrial Revolution (Industry 4.0) based on Cyber-Physical Production System (CPPS). It is clear that as more predictive analytics software and embedded IoT are integrated in industrial products, predictive technologies can further intertwine smart IoT to predict product performance autonomously and further optimize the smart service systems.

The presentation will address the trends of predictive big data analytics and CPS for future industrial PHM application. First, predictive analytics and Cyber-Physical System (CPS) enabled industrial systems will be introduced. Second, advanced predictive analytics technologies for self-aware industrial systems with case studies will be presented. Finally, business innovation based on industrial big data will be introduced using case studies.