DIGITAL TWIN OF AUTONOMOUS MANUFACTURING FOR INTEGRATED SYSTEM HEALTH MANAGEMENT

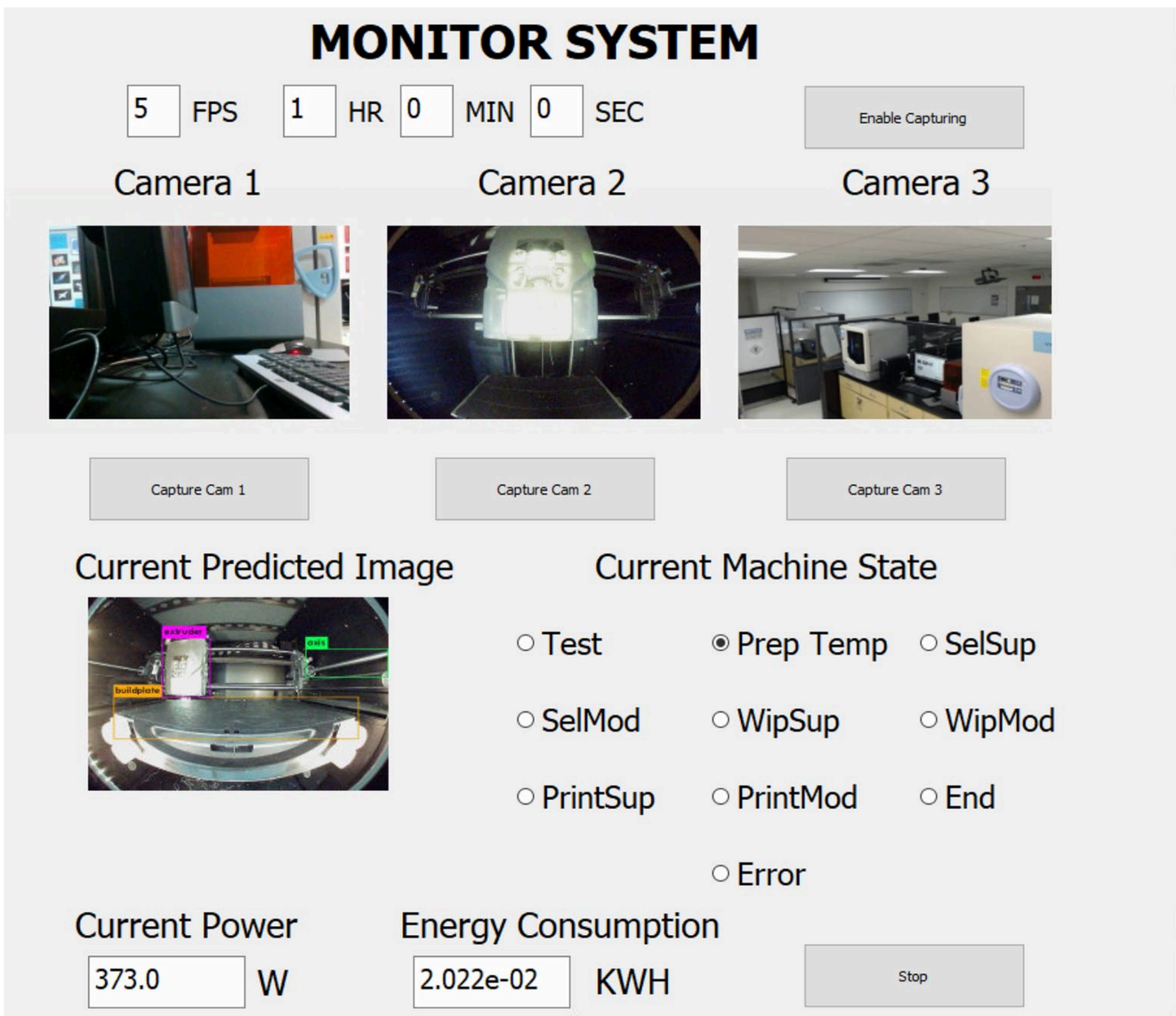
AUTONOMY RESEARCH CENTER FOR STEAHM

Research Objective

The outcome will be a fully defined digital twin of autonomous manufacturing (AMFG) for smart connected human (SCH) system so that we can access the real-time status and comprehensive analysis of every important perspective of AMFG such as mechanical, electrical, physical and chemical analysis. It will be feasible for 3D printing, robotics, assembly line & food manufacturing on earth and in-space assembly (iSA) 20m Segmented UV/V/NIR telescope.

Research Approach

In the digital twin system, we propose to prototype a system that associate operator activities and operating information. This monitor collects data generated by chips-sensors-in-a-system on a continuous basis. The data will first be stored locally with a timestamp to analyze the condition of components and the corresponding process. We will use different modeling techniques such as Fuzzy ARTMAP and Learn++ to find the connection of an operation/process with the condition of the system by analyzing these data. The local model will be improved as more operating data are collected. Once the model is well-trained, we expect to use the model to monitor new data stream to predict future operating states of the system and provide feedback to the operator through the smart connect worker system. Longitudinal data can be stored and analyzed on the cloud.



Research Team

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