Neuromorphic Sensors for Anomaly Detection

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Neuromorphic sensors, commonly referred to as event based cameras, respond only to changes in stimuli as they occur. They have the potential benefits of higher dynamic range and higher effective frame rates, relative to traditional framing sensors. This is possible because in an event based camera a pixel only outputs data when a stimulus occurs at that pixel. The output is the x and y position of the pixel, the time stamp for when the event occurred, and whether or not the intensity increased or decreased, essentially a time stamped spike train. The stimulus can be either an increase or a decrease in intensity. Neuromorphic sensors have found uses for applications ranging from temporal anomaly detection to autonomous driving. In order to characterize the performance characteristics of event cameras, we have developed a task specific hardware-in-the-loop testing system shown schematically in the figure below. In this presentation we will discuss the test system, as well as the measurement of the temporal and spatial response of a neuromorphic sensor.