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### **Reinforcement Learning for Coordinated Sampling in Sensor Networks**

As sensors get smaller, it is possible to continuously monitor a variety of environments using a network of sensors. For example, a network of smoke sensors and cameras can collectively monitor an outdoor area for fires. However, the small size also limits the energy (stored in batteries) available to the sensors. Thus, it is important to control the operation of the network of sensors to conserve their energy and ensure the system will not run of power quickly. Actively conserving the energy expenditure is thus one of the central issues in Internet-of-Things. In this project, we will study adaptive sampling methods to prolong the lifetime of sensors. Specifically, we will apply reinforcement learning techniques to this problem. The idea is to learn the optimal sensing strategy for each sensor in a network using the data from prior operations of the network. We will evaluate the reinforcement learning approach using both data collected from a network of sensors in an indoor laboratory environment and larger synthetic datasets. Students working on the project should ideally have a background in machine learning and will be expected to write computer programs to collect data and implement machine learning algorithms on various datasets.