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*Using Artificial Intelligence and Raspberry Pi to Monitor and Conserve Household Water Usage*

With the purpose of increasing awareness towards household water over usage, the goal of this project was to design an artificial intelligence program that could predict and help conserve future water usages. Another aim was to use a Raspberry Pi microcomputer to import data from online to be used as inputs in the artificial intelligence program. To accomplish these goals, I learned about multi-layer neural networks, and soon, began developing the first edition. Meeting with local water companies helped detail plans for monitoring water usages efficiently, by attaching sensors on appliances. To maximize efficiency in the program, I updated the program's criteria as Science Fair progressed. For the first volume, the program was able to receive simple inputs of data and present predictions of future usages based on previous inputs. For the second volume, the neural network was able to take larger sets of data and was shortened to make it faster. Additionally, sensors were able to monitor water usage and track how much water various appliances and fixtures used, revealing an efficient way for the network to pinpoint ways to conserve water. Using a python program, the Raspberry Pi could import data to be used as inputs in the network. I was able to consult with artificial intelligence experts later to expand the functionalities of the program. Data showed that water usages decreased when the network targeted ways to conserve water. This experiment accomplished goals of reducing water usages, and future goals include expanding functionalities to monitor sprinkler systems.