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ITAI 1378

SVM Analysis and Reflection

* Introduction
  + Support Vector Machines, or SVM’s, are machine learning algorithms used mainly for classification. In this lab, I used these algorithms on the CIFAR-10 dataset, which classified the images and allowed for exploration into AI’s practical side.
* Understanding
  + While trying to understand what SVM’s did specifically, I did not fully understand it at first. Once I was able to visualize the process of the hyperplane and support vectors, it made more sense to me. I learned in this lab that SVM’s work well on smaller amounts of data, and they can use kernels for data that is not linear. I learned SVM’s use of support vectors makes it fantastic for memory management, and that a hyperplane is really just a 3D line.
* Data Preparation
  + The CIFAR-10 dataset had to be prepared before being incorporated. Here, images were converted to greyscale, and then resized to help with data size. This was necessary as we learned SVM’s require data in 1D, thus they must be “flattened.” These images then got loaded into the dataset folder, and presented a demo image. After all of this data manipulation was done, the data was split into training and testing sets. This was done using the Scikit-Learn train\_test\_split function. Once the data was split, we could begin training.
* Model Training and Evaluation
  + Training the SVM in the notebook was relatively simple after the earlier steps. The data was processed surprisingly quickly, I am used to my AI projects taking much longer. It was here the different kernel types were broken down, further helping my understanding. This lab helped me not only understand come complicated AI mechanics, but enabled me to apply them in a practical manner.