MAIS 202 - PROJECT DELIVERABLE 1
Home Security App

Description:

1. Dataset: https://cocodataset.org/#home
   a. Why this dataset?
      i. Captures everyday scenery (useful when detecting intruders in a home setting)
      ii. 80 categories, large-scale dataset, includes object segmentation
2. Methodology
   a. Data Preprocessing
      i. Identify different categories using histograms
      ii. Instructions for data preprocessing (for COCO dataset) presented here: https://towardsdatascience.com/master-the-coco-dataset-for-semantic-image-segmentation-part-1-of-2-732712631047#:~:text=%E2%80%9CCOCO%20is%20a%20large%2Dscale,segmentation%2C%20and%20captioning%20dataset.%E2%80%9D&text=COCO%20provides%20multi%2Dobject%20labeling,versatile%20and%20multi%2Dpurpose%20dataset.
   b. Machine Learning Model
      i. Identify an intruder (considering no occupants of the house are present)
      ii. Machine learning model/algorithm: classify human (intruder) vs not human. Due to this being a classification problem, the following algorithms may be favourable (considering there may be several different characteristics that define a human subject): Decision Tree or Naive Bayesian model. Logistic Regression or Neural Networks may also be viable options.
      iii. Evaluation Metric: Since there may be an imbalance in the classification (more chances of no intruder than one being present), evaluation should be done based on recall-precision metrics (F1 Score) and a confusion matrix instead of accuracy alone.
      iv. Final webpage/app: Simple user interface that, when given an image, identifies intruder (yes/no). If yes, notifies user along with a picture of the suspected intruder, and options to confirm (correct identification by algorithm/incorrect identification)