ECE501_2025_12_Group_2

Project name: **Image Tampering Detection (Forgery Localization)**

Team Details:

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Work done till week 1:

1. Selection and Knowledge of the topic:

● Investigated the relevance of image tampering detection to applications in the real world, e.g. to fake news detection, digital forensics, and copyright.

● Learned the general concept: how to point out duplicated or manipulated regions in an image with the help of digital image processing.

2. Review of Literature / Preliminary Study:

● Learned the common methods of tampering, including copy-move, splicing and retouching of images.

● Explored methods that existed such as:
   ○ Block-based matching (e.g. breaking the image down into blocks and matching them based on either correlation or DCT features).

- Matching by feature (e.g. with SIFT, SURF or ORB features to locate duplicated areas).

- Searched about the research paper and GitHub project for a similar kind of topic to implement something.

3. Tool and Library Selection:

- Choose Python as the language of choice.
- Libraries we are going to use:
    - OpenCV,
    - NumPy to perform arithmetical operations on numbers and Matlpotlib

Plan for Next Week (Week 2):

Set Up Environment:

Install all the libraries and tools that are necessary (OpenCV, NumPy, Matplotlib, etc.).
In a basic mode, set up some sort of a code and datasets and output project directory.

Dataset Collection:

Find tampered image samples in publicly available datasets, e.g. CASIA v2, CoMoFoD or IMD2020.
Choose a few which can be experimented.

Image Preprocessing: http://SimpleImagePreprocessing.exe

Convert images to grayscale.
Scale and rescale input images.
Simple filters To get a familiarity of behavior of noise and edges.

Start Prototype Design:

Test and develop block based comparison algorithm (in copy-move forgery detection).
Determination of the differences between the suspect and normal areas, on a case of images.

Challenges/Observations:

Web experience in feature based and block based.
Choosing data and measure of evaluation (precision, recall, F1) that will be the most appropriate in consideration of the goals of the project.

Future(s) expected (within the next weeks):

A simple working prototype, which shows possible areas of tampering in a test image.
Block based and feature based methods are clearly compared in terms of their accuracy and performance.