

Fake product logo generation and detection



Scoping:

- Build a machine learning model to generate and detect “fake” product logos for 100 brands.
- Given an input logo, your AI models needs to:
 - i. Generate image that is different to the input image, but may still be perceived as a counterfeit (or fake) image.
 - ii. Detect any fake images in the following categories:
 - a. An image that bears no similarity to the logo. (irrelevant)
 - b. An image that mimics the logo, yet is counterfeit. (fake)
 - c. An image that is the authentic logo. (real)

Data:

- Crawl images from the Internet or download a public dataset (if there exists a fake logo database)
- Consider utilizing AIGC (Artificial Intelligence Generated Content) software to create fake images by executing the appropriate prompt.
- Annotation: Should there be a necessity for dataset labelling, the creation of labelling tools will be essential.

Initial direction: (this is merely a recommendation; the student is required to conduct a thorough research on the state-of-the-art in this area)

- You could employ a Generative Adversarial Network (GAN) with a modified discriminator that can yield multiple outcomes, such as real, fake, and irrelevant.

Mathematical contribution

When designing your model, it is anticipated that you will utilize several mathematical tools, such as achieve a more accurate probability measure distinguishing the distribution of real and fake data, as well as the mathematical evidence to decide the “cut-off” between the fake and irrelevant data.