PROJECT IDEAS

The following projects are examples of what can be accomplished within the time frame of our class. This list is not exhaustive, but it may inspire you to come up with your own ideas for projects. Many of the necessary resources for building these applications can be found online. You can leverage these resources to build your own projects.

1. Image-to-Image Translation: develop a deep learning model to create color images/videos from black and white pictures or tasks like sketches to color photographs, photos from day to night, human-to-animal etc.
2. Environmental sound classification: classify sounds in the environment, such as traffic noise or bird calls, which can be used to monitor the health of ecosystems or to improve noise pollution models. You can develop a quality index for the different parts of a city using this model.
3. Music classification: Deep learning algorithms can be used to classify different types of music, such as rock, pop, classical, or jazz.
4. Photo Inpainting: filling in an area of a photograph that was removed for some reason. Or remove elements from an image such as removing rain, dust etc.
5. Image captioning: understand the content of an image using deep learning and organize multiple images based on their contents.
6. Auto-selfie detection: capture your selfie only when you have certain facial expressions such as happy, confused or sad. This can be generalized to group selfies as well.
7. Speech Emotion Recognition: detect the emotions of a speech from an audio stream. This could be interesting to analyze several famous public speeches.
8. Detection of abnormalities in medical images: This project involves training a deep learning model to detect abnormalities in medical images, such as tumors or abnormalities in organs.
9. Segmentation of medical images: This project involves training a deep learning model to segment medical images, meaning to label each pixel in the image with its corresponding class (such as "tissue," "tumor," or "background").
10. Detection of military objects: Developing a deep learning system for automatic detection and classification of various military communications equipment, such as radios, antennas as well as bases, depots, and airfields, in aerial imagery.
11. Hand gesture recognition: predict the gesture of a hand from a real-time video stream. For example, you can create a sign language model, or a secret sign language that can be deciphered with your model.
12. Personal Protective equipment (PPE) detection: in high-risk workplaces, detect if workers are wearing the right PPEs. This could be used to send an alert to a central system.
13. Parking occupancy: detect the location and number of open parking lots and send info to a central location to be displayed when entering the area.
14. Pose estimation: detect certain behaviors in closed environment settings. For example, detect the drowsiness of a driver in a car or pose estimation of a dancer in a performance etc.
15. AI assisted short animation: idea is to first generate a story with NLP tools, then convert the story to images piece-by-piece using text-2-image neural network models. You can then add your own voice to the data to create a video. Check [here](https://twitter.com/ammaar/status/1615133036974321665?s=20&t=q_D2rXzQmByHoifnozf05g).
16. LLM takes Toefl: create a pipeline to answer Toefl questions using one of the large language models(GPT, Bloom etc.)

Check the following websites for more ideas

1. [27+ Most Popular Computer Vision Applications and Use Cases in 2023](https://www.v7labs.com/blog/computer-vision-applications)
2. [11 Top Image Recognition Apps to Watch in 2021](https://www.netguru.com/blog/image-recognition-apps)
3. [18 Impressive Applications of Generative Adversarial Networks (GANs)](https://machinelearningmastery.com/impressive-applications-of-generative-adversarial-networks/)