Project Planning Worksheet

To pass this course, you'll need to create a project that matches this criteria:

> *"Based on your understanding of the material, you're required to build and submit an open-source project that uses NVIDIA Jetson and incorporates elements of AI (machine learning or deep learning) with GPU acceleration, along with a video demonstrating the project in action. For example, you could collect your own dataset and train a new DNN model for a specific application, add a new autonomous mode to JetBot, or create a smart home / IoT device using AI - these need not be limited only to topics covered in the course. For inspiration, see the Jetson Community Projects page - the possibilities are endless!"*

To pass the certification, your project will be reviewed based on the following criteria:

- **AI** - The project uses deep learning, machine learning, and/or computer vision in a meaningful way and demonstrates a fundamental understanding of creating applications with AI. Factors include the effectiveness, technical complexity, and performance of your AI solution on Jetson.
- **Impact / Originality** - The concept of your project is novel and applies AI to solve or address challenges or issues faced by yourself or society. Also, our ideas and work are either original or derivative in a significant way.
- **Reproducibility**- Any plans, code, and resources needed for someone else to build and use the project are included in the repository and are easy to follow.
- **Presentation and Documentation** - The video effectively demonstrates and explains various aspects of the project, and there exists a clear, complete README in the repository that documents any steps needed to build/run the project, along with diagrams and images.

Follow these steps to plan out your project

Part One: Brainstorming

Write down 3-5 ideas for problems that you see in the world around you that you could create an AI to help solve. You can use [student example projects](#) or [community example projects](#) for inspiration or look back on past lessons that you enjoyed.

1. An AI that tells what the object is and which recycling bin it should be thrown into.

2. <mark>An AI that tells what event you can attend for an inputted outfit</mark>

3. An AI that detects humans for jaywalking

4. <mark>An AI that detects what kind of writing utensil you are holding.</mark>

5.

Part Two: Details

Write down the answers to these questions for your **two favorite** ideas:

AI: How would the AI work? Technically speaking what kind of network is it and how does this network work?

Idea 1:
Network: DetectNet (SSD-Mobilenet-v2)

How the network works: For an inputted image, the network detects an object(s) with the image and draws a bounding box around for every object(s). It then outputs the classification of the object and its accuracy(confidence value)

How the project works: When the AI is given an input of an image of an outfit, it detects the clothing and outputs what specific types of events(wedding, funeral, formal party) you can attend by wearing that outfit.

Idea 2:
Network: Image Classification (resnet-18)

How the network works: When inputting an image on ImageNet, the network gives a guess on what the image/object is and gives a percentage of how sure it is correct.

How the project works: The AI is given an image of a writing utensil; in return, it tells what type of writing utensil it is and how it can be used so that young students understand how to properly use them when studying.

Impact: What impact would this project have? Who does it impact and in what ways?

Idea 1: With the assistance of the AI suggesting the satisfactory event you can attend, it can prevent risks of failed relationships and awkward moments such as when wearing an inappropriate t-shirt for a funeral, for people who have no sense of fashion.

Idea 2: By being aware of certain types of writing utensils and how they can be used, young students who are not familiar with them can grasp a sense of what they are as well as understanding how to use them properly when studying or taking notes during class.

Part Three: Resources

Now that you have thought out the impact and technical aspects of how the AI will work, it is time to map out what resources are going to be needed to complete your project.

Docs from jetson-inference: Add your documentation or tutorial link below
Using ImageNet

Example code: Add your example code below
ImageNet Example Python
Image Recognition Code
Image Recognition Code2

Datasets: If applicable, add the dataset that you will be using below
Ruler
Pencil Case
Pencil Sharpener
Pencil Images
Pen Images

Miscellaneous: Add any other resources you might need for your project below.
Objects Network Can Recognize

Part Four: Documentation

Video: Write down any key points that you want to add into your video below

- How to run the project

- How the code runs/project operates

- How a normal operation would look like

Documentation: Write down any key points that you want to make sure are in your readme doc.

- What the project is about and why I created it

- How to run the program/project

- Link to the video.

- Link to all the data.

Reproducibility: How could your project be reproduced or run on another machine. Make sure to remember all steps that make your project work.

1. Connect to your nano via SSH on VS Code.

2. Download the folders containing all the images and imagenet.py

3. Open up a new terminal on VS Code.

4. Change directories to the folder where you have all the images and imagenet.py that you just downloaded. (ex) is you have everything under nvidia_project, run the command 'cd nvidia_project'

5. Run the command 'python3 imagenet.py name of folder/image' For example, if you are trying to input image pen_1.jpg which is inside the pen folder, run the command 'python3 imagenet.py pen/pen_1.jpg'

6. Check if the network correctly identified the image and printed out a correct statement.