CAPSTONE PROJECT : TEAM ZENITH

PROPOSAL

1. **Domain and Context**

   Briefly detail the domain in which your work will be done. Give as much context as you can about the domain and why the problem you intend to solve is important within this domain.

   Currently autonomous driving is an area of interest and research. We would like to solve a problem in this domain and for solving similar instance segmentation problems.

   Car manufacturers are widely using Artificial Intelligence to offer variety of smart solutions in the automotive industry. One such solution is Autonomous/Self driving cars. However, to develop car which is completely autonomous in nature, it should be able to identify varied range of objects just like humans are able to recognize in real life.
   Our team's approach is to use Advance Computer Vision techniques such as Semantic segmentation and instance segmentation to help AI enabled cars to identify different objects while driving and respond accordingly.
   Our target is to help AI enabled cars understand and differentiate between different objects like car, motorcycle, bicycle, pedestrian, truck, bus, and tricycle.

2. Problem Statement

   Clearly describe the problem that you're solving. The problem should have a relevant solution (avoid open-ended, intractable problem statements). The problem is quantifiable, measurable, and replicable

   Our team's approach is to use Advance Computer Vision techniques such as Semantic segmentation and instance segmentation to help AI enabled cars to identify different objects while driving and respond accordingly.

   The scope of this project includes identifying each object instance of each pixel for every known object within an image, which are car, motorcycle, bicycle, pedestrian, truck, bus, and tricycle. Detect these objects efficiently by performing detection and segmentation for self-driving cars. While driving, it is highly important to be able to quickly detect objects, the difference between them whether it is a vehicle, person …etc.

3. Dataset(s)

   Describe the dataset(s) and/or input(s) to be used in the project. If it's proprietary, a data dictionary and context must be included. Also include details on how you will acquire data. If you can foresee any challenges with acquiring or using the information, please include the challenges and how you plan to overcome them.

   The dataset contains segmented and original driving images. There are multiple labels like car, motorcycle, person, bicycle etc. We will evaluate seven different instance-level annotations, which are car, motorcycle, bicycle, pedestrian, truck, bus, and tricycle.
   Data set have a mask for every instance, for example, a pixel value of 33000 means it belongs to label 33 (a car), is instance #0, while the pixel value of 33001 means it also belongs to class 33 (a car) , and is instance #1. These represent two different cars in an image."
   Reference link for data set - https://www.kaggle.com/c/cvpr-2018-autonomous-driving/data