

**Question 1.** Give an elevator pitch (no more than 100 words) for your final project idea.

Imagine a technology that prevents drowsy driving accidents by watching your eyes in real-time. Our system acts like a guardian angel for drivers, instantly detecting fatigue and sounding an alarm before you become a potential road safety statistic. We're not just building a device; we're saving lives by keeping drivers alert and roads safer.

**Question 2.** Give the following for your data set,

1) Collector(s): The frames were extracted from videos as images using VLC software. After that, the Viola-Jones algorithm has been used to extract the region of interest from captured images. The obtained dataset (DDD) has been used for training and testing CNN architecture for driver drowsiness detection in the “Detection and Prediction of Driver Drowsiness for the Prevention of Road Accidents Using Deep Neural Networks Techniques” paper.

2) Year: 2021

3) Title of Dataset: *Driver Drowsiness Dataset (DDD)*

4) Version Number (if any): Not applicable.

5) Publisher: [Ismail Nasri](#), [Mohammed Karrouchi](#), [Hajar Snoussi](#), [Kamal Kassmi](#) & [Abdelhafid Messaoudi](#)

6) DOI or URL: [https://doi.org/10.1007/978-981-33-6893-4\\_6](https://doi.org/10.1007/978-981-33-6893-4_6)

7) Study/Paper/Reason: The dataset was collected using the paper **Detection and Prediction of Driver Drowsiness for the Prevention of Road Accidents Using Deep Neural Networks Techniques**. ([Reference](#))

**Question 3.** List the language and the libraries you'll use. E. g., Python 3.13.1, Numpy, Matplotlib etc.

- ☐ TensorFlow/Keras
- ☐ NumPy
- ☐ OpenCV
- ☐ Matplotlib
- ☐ scikit-learn

**Question 4.** Describe what code will you be writing yourself?

I'll create Python code using Keras and TensorFlow to build a Convolutional Neural Network (CNN) for drowsiness detection involving Data preprocessing; Model Selection and Justification; Model architecture for CNN including convolutional layers, pooling layers and fully connected layers; Training and Validation; and finally model performance metrics.

**Question 5.** What do you think is the best choice of model(s) for your project? Why?

Convolutional Neural Networks (CNNs) are chosen for this project due to their effectiveness in image recognition tasks. CNNs excel at extracting spatial features from images, making them ideal for identifying patterns in facial expressions.

**Question 6.** What are the hyper-parameters of this model and how will you pick the optimal ones?

Hyperparameter selection for drowsiness detection involves finding optimal neural network configurations through techniques like grid search and cross-validation. Key parameters include learning rate, batch size, epochs, and dropout rates. The goal is to balance model complexity with generalization, minimizing loss and maximizing accuracy by systematically testing different combinations and evaluating performance on validation data.

**Question 7.** How will you evaluate the performance of the model?

By comparing the Training Accuracy and Validation Accuracy and also comparing no of epochs and Training loss.

**Question 8.**

<https://github.com/VenkateshDommata/Dommata-b00116626-spring-2025>