SYNOPSIS OF THE PROJECT

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| Name | VAISAKH R MENON |
| Roll no | 53 |
| Name of Guide | Ms.JOICE T |
| Contact Number | 9605044363 |
| Email id | Vaisakhrx8@gmail.com |
| Shared folder/git repository details |  |
| Project Title | A Convolutional Neural Network Based Early Warning System to Prevent Elephant-Train Collisions |
| Description of project | Abstract—One serious facet of the worsening Human-Elephant Conflict (HEC) in nations such as Sri Lanka involves elephanttrain collisions. Endangered Asian elephants are maimed or killed during such accidents, which also often results in orphaned or disabled elephants. Furthermore, railway services incur significant financial losses and disruptions to services annually due to such accidents. Most elephant-train collisions occur due to a lack of adequate reaction time due to poor driver visibility at sharp turns, nighttime operation, and poor weather conditions. Initial investigations also indicate that most collisions occur in localised “hotspots” where elephant pathways/corridors intersect with railway tracks. Taking these factors into consideration, this work proposes the leveraging of recent developments in Convolutional Neural Network (CNN) technology to detect elephants using an RGB/infrared capable camera, around known hotspots along the railway track. The CNN was trained using a curated dataset of elephants collected on field visits to elephant sanctuaries and wildlife parks in Sri Lanka. With this vision-based detection system at its core, a prototype unit of an early warning system was designed and tested. Initial results indicate that detection accuracy is sufficient under varying lighting situations, provided that comprehensive training datasets that represent a wide range of challenging conditions are available. The overall hardware prototype was shown to be robust and reliable. We envision a network of such units may help contribute to reducing the problem of elephanttrain collisions and has the potential to act as an important surveillance mechanism in dealing with the broader issue of the human-elephant conflict |
| Front end and Back end tools | Python |

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