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**CSE 541: Computer vision**

**WEEKLY REPORT 1**

**[Group: 7]**

**SECTION – 1**

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| **Details** | | |
| **Enrolment No.** | **Name** | **Programme** |
| AU2120225 | Preksha Morbia | BS CS |
| AU2140081 | Divya Patel | B.Tech (CSE) |
| AU2140082 | Hrishikesh Rana | B.Tech (CSE) |
| AU2140099 | Aditya Chaudhari | B.Tech (CSE) |

**Problem Statement:**

* Develop Oriented Object Detection (OOD) models tailored for Autonomous Unmanned Drones.
* Utilise a specialised dataset to train models emphasising accurate detection and tracking of moving objects with oriented rectangular bounding boxes.
* Evaluate and validate the trained models to assess their effectiveness in several aerial scenarios.

**Literature References:**

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| Title | Author | Approach |
| Oriented Object Detection in Aerial Images with Box-enhanced IoU Loss | Jing, L., Zhang, C., Zhou, J., Zhang, Y., & Wang, J. | The paper introduces a novel Box-enhanced Intersection over Union (IoU) loss function to enhance the accuracy of detecting oriented objects in aerial imagery, specifically from unmanned aerial vehicles (UAVs) or drones. This approach seeks to address challenges associated with traditional IoU loss functions by tailoring the loss function to accommodate better the characteristics of oriented objects commonly encountered in aerial imagery. |
| Oriented Object Detection in Aerial Images: A Review and Benchmark | Fan, C., Li, X., Cui, Z., Zhang, G., & Bai, L. | The paper thoroughly examines oriented object detection techniques in aerial images, emphasizing the challenges and methodologies pertinent to detecting objects with oriented rectangular bounding boxes. It also introduces a benchmark dataset and evaluation metrics to gauge model performance accurately. This comprehensive review aids in advancing the understanding and development of effective oriented object detection models for aerial imagery applications. |

Weekly Progress:

In our project, the primary objective is to develop Oriented Object Detection (OOD) models specifically designed for Autonomous Unmanned Drones (AUDs) utilizing computer vision techniques. To achieve this goal, we began by conducting extensive research to understand the fundamentals of OOD and its relevance to AUDs. We explored existing research papers and literature focusing on object detection algorithms, computer vision methodologies, and applications in drone technology. Through this process, we gained a comprehensive understanding of the key challenges and requirements involved in developing OOD models tailored for AUDs. This included considerations such as real-time processing, robustness to environmental conditions, and efficient resource utilization. Armed with this knowledge, we are now equipped to proceed with the development and implementation of innovative OOD algorithms that address the unique needs of autonomous drones, ultimately contributing to advancements in aerial surveillance, monitoring, and other drone-based applications.