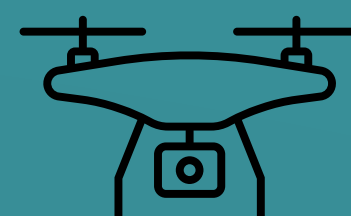
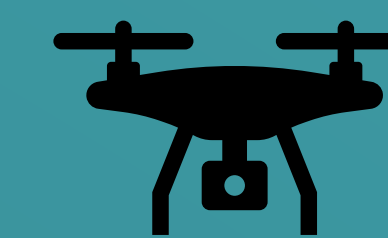




UAV Image Detection



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Introduction

I worked as an Undergraduate Research Assistant in the Department of Electrical & Computer Engineering with the DSPCAD Group, and our research work focused on the improvement of UAV image detection systems, particularly with a focus on human detection in Disaster Zones, and also detecting human poses.

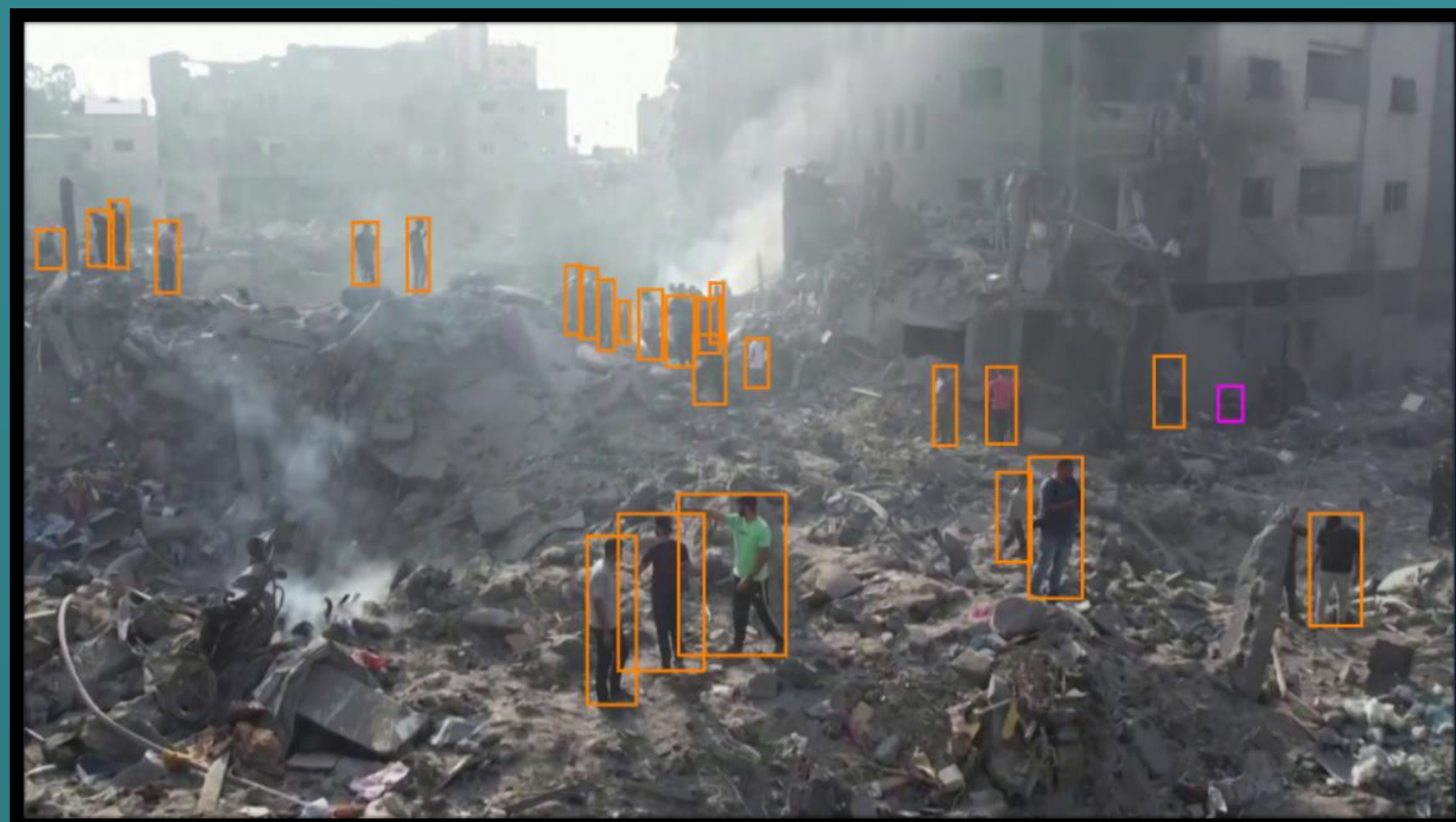


Image from <https://www.youtube.com/watch?v=OkVM5PapvQg>

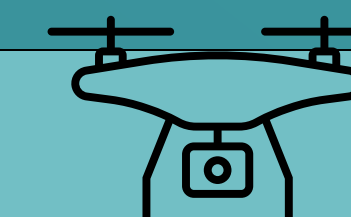


Image from <https://www.youtube.com/watch?v=yir6ArRZY4o>

Acknowledgments:

I would like to thank everyone at the DSPCAD Group, especially Professor Shuvra Bhattacharyya, for giving me the opportunity to work on an incredible project and be able to continue throughout the Summer of 2024. And I would also like to thank Dr. Holtz and Dr. Merck for running SGC as it was part of the reason I was motivated to apply for this position.

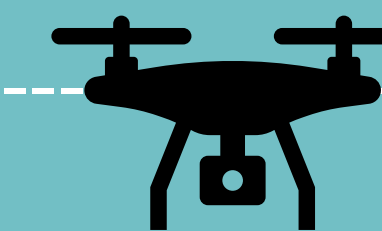
Activities



- Researching Military Conflicts and Natural Disaster Events
- Collecting UAV images of humans in Disaster Areas
- Performing Dataset Annotations using 'Roboflow'
- Presenting my work to representatives from the Army Research Lab

Issues Confronting Site:

The main issue involves Machine Learning. For UAV technology to recognize people and different types of poses people have, a Machine Learning algorithm must be applied using collected data. But as it stands, there is very little Drone Footage/Aerial Footage data of people in these disaster zones. This is why we are working on building a dataset of images; So that this kind of work can progress and eventually become a reality.

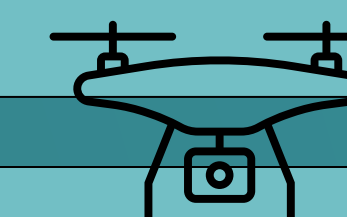


Impact :

My work has added 700 hundred annotated images from various natural disasters and conflicts around the world. Adding these to the dataset has led the group closer to having a large enough dataset to be able to accurately detect human poses in chaotic backgrounds. Since starting this project I have learned a lot more about how Machine Learning works, the process of data collection, researching modern events, and better understand the importance of image/signal processing.

Future Work:

As this project continues, having this dataset will allow the group to use the data for more scenarios besides human detection. It will also add to an open source set of data that anyone can access to work on different or similar projects/research.



Site Information:

Site: University of Maryland – College Park
Website: Maryland DSPCAD Research Group · Wiki · DSPCAD Pub / dspcadwiki · GitLab (umd.edu)
Supervisor: Professor Shuvra Bhattacharyya
Mission: The improvement of UAV human (and human poses) detection



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