DEPARTMENT OF INFORMATION TECHNOLOGY
B. Tech 4/4, II-SEMESTER
II Semester 2021-22

SOCIAL DISTANCE DETECTION WITH DEEP LEARNING MODEL

ABSTRACT

The ongoing COVID-19 corona virus outbreak has caused a global disaster with its deadly spreading. Due to the absence of effective remedial agents and the shortage of immunizations against the virus, population vulnerability increases. In the current situation, as there are limited vaccines available; therefore, social distancing is thought to be an adequate precaution against the spread of the pandemic virus. The risks of virus spread can be minimized by avoiding physical contact among people. The purpose of this work is, therefore, to provide a deep learning platform for social distance tracking using an overhead perspective. The framework uses the YOLOv5 object recognition paradigm to identify humans in video sequences. The transfer learning methodology is also implemented to increase the accuracy of the model. In this way, the detection algorithm uses a pre-trained algorithm that is connected to an extra trained layer using an overhead human data set. The detection model identifies peoples using detected bounding box information. Using the Eueuclidian distance, the detected bounding box centroid's pairwise distances of people are determined. To estimate social distance violations between people, we used an approximation of physical distance to pixel and set a threshold. A violation threshold is established to evaluate whether or not the distance value breaches the minimum social distance threshold. In addition, a tracking algorithm is used to detect individuals in video sequences such that the person who violates/crosses the social distance threshold is also being tracked

Course Outcomes (COs)

Course Outcomes

After completing this course, the student will be able to:

CO Number	CO Statement	Taxonomy
CO1	Demonstrate the technical knowledge to identify problems in the field of Information Technology and its allied areas.	Understand
CO2	Use literature to identify the objective, scope and the concept of the work.	Apply
CO3	Analyze and formulate technical projects with a comprehensive and systematic approach.	Analyse
CO4	Identify the modern tools to implement technical projects.	Evaluate
CO5	Design engineering solutions for solving complex engineering problems.	Create
CO6	Develop effective communication skills, professional behaviour and team work.	Understand

CO-PO/PSO MATRIX:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	1	2					3	2	2	2	3	2	1
CO2	2	1	2	2	1				3	2	2	2	3	3	
CO3	2	3	2	2	1				3	2	2	2	2	2	
CO4	3	1	3	2	3				3	2	2	2	2	3	1
CO5	2	2	3	3	1				2	2	1	2	2	1	1
CO6	1	1	1	2	1				2	3	2	2	1	1	2
Course	2.2	1.7	2.0	2.2	1.2				2.7	2.2	1.8	2.0	2.2	2.0	0.8

PO1	Engineering Knowledge	PO7	Environment & Sustainability
PO2	Problem Analysis	PO8	Ethics
PO3	Design / Development of Solutions	PO9	Individual & Team Work
PO4	Conduct Investigations of complex problems	PO10	Communication Skills
PO5	Modern Tool usage	PO11	Project Management & Finance
PO6	Engineer & Society	PO12	Life-long Learning