|  |  |  |  |
| --- | --- | --- | --- |
| Title | Cauli-Det: enhancing cauliflower disease detection with modified YOLOv8 | | |
| Author(s) Name | Md. Sazid Uddin, Md. Khairul Alam Mazumder, Afrina Jannat Prity, M. F. Mridha, Sultan Alfarhood, Mejdl Safran and Dunren Che | | |
| Contact Email(s) | firoz.mridha@aiub.edu | | |
| Published Journal Name | Frontiers in Plant Science | | |
| Type of Publication | Journal | | |
| Volume | 15 | Issue |  |
| Publisher | Frontiers | | |
| Publication Date | 2024/4/18 | | |
| ISSN |  | | |
| DOI | doi: 10.3389/fpls.2024.1373590 | | |
| URL | https://www.frontiersin.org/journals/plant-science/articles/10.3389/fpls.2024.1373590/full | | |
| Other Related Info. |  | | |
|  | | | |

|  |  |
| --- | --- |
| Abstract |  |
| Cauliflower cultivation plays a pivotal role in the Indian Subcontinent’s winter cropping landscape, contributing significantly to both agricultural output, economy and public health. However, the susceptibility of cauliflower crops to various diseases poses a threat to productivity and quality. This paper presents a novel machine vision approach employing a modified YOLOv8 model called Cauli-Det for automatic classification and localization of cauliflower diseases. The proposed system utilizes images captured through smartphones and hand-held devices, employing a finetuned pre-trained YOLOv8 architecture for disease-affected region detection and extracting spatial features for disease localization and classification. Three common cauliflower diseases, namely ‘Bacterial Soft Rot’, ‘Downey Mildew’ and ‘Black Rot’ are identified in a dataset of 656 images. Evaluation of different modification and training methods reveals the proposed custom YOLOv8 model achieves a precision, recall and mean average precision (mAP) of 93.2%, 82.6% and 91.1% on the test dataset respectively, showcasing the potential of this technology to empower cauliflower farmers with a timely and efficient tool for disease management, thereby enhancing overall agricultural productivity and sustainability | |