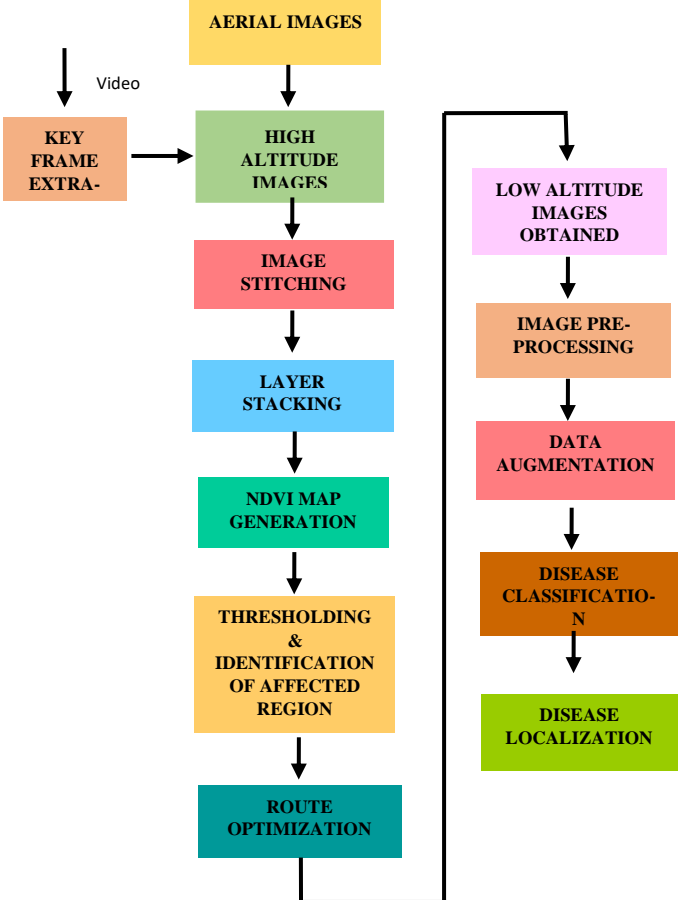
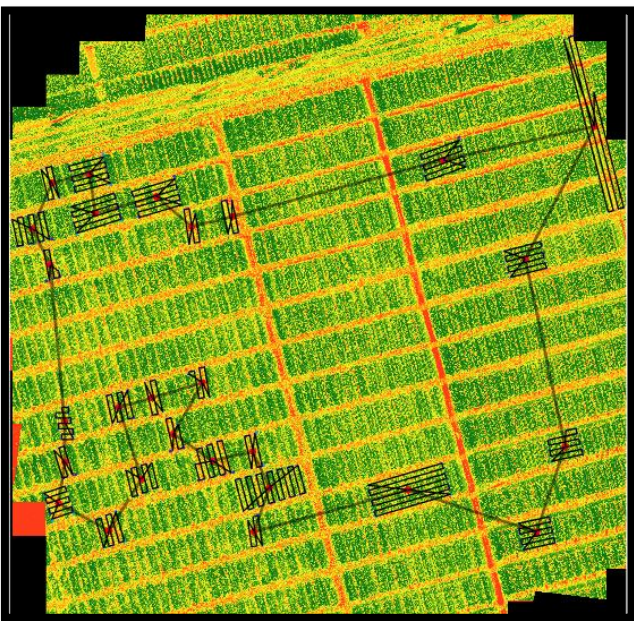



Final Year Project Showcase Batch-2017
Year 2021

Department: Computer & Information Systems Engineering Programme: Computer & Information Systems Engineering		
1	Project Idea	An Efficient Crop Health Monitoring System using Aerial Images
2	Process	 <pre> graph TD AI[AERIAL IMAGES] --> HAI[HIGH ALTITUDE IMAGES] V[Video] --> KFE[KEY FRAME EXTRA-] KFE --> HAI HAI --> IS[IMAGE STITCHING] IS --> LS[LAYER STACKING] LS --> NDVI[NDVI MAP GENERATION] NDVI --> TIR[THRESHOLDING & IDENTIFICATION OF AFFECTED REGION] TIR --> RO[ROUTE OPTIMIZATION] RO --> LAIO[LOW ALTITUDE IMAGES OBTAINED] RO --> DL[DISEASE LOCALIZATION] LAIO --> IPP[IMAGE PRE-PROCESSING] IPP --> DA[DATA AUGMENTATION] DA --> DC[DISEASE CLASSIFICATION] DC --> DL </pre>
3	Outcome	<ul style="list-style-type: none"> • Obtained affected regions through high altitude aerial images • Obtained optimized path to acquire low altitude images and spray pesticides over the affected region • Identification and Localization of disease through low altitude images.
4	Evidence (Theoretical Basis)	<p>Agriculture is considered the backbone of Pakistan's economy; it directly supports the country's population and accounts for 21 percent of gross domestic product (GDP). Nearly 70 percent of the country's population resides in rural areas, and is directly or indirectly linked with agriculture for their livelihood. The remaining 30 percent of people are an inseparable part of this field. Because from agriculture, we get various raw materials and especially crops, which serve as a staple food for people, but it is becoming a strenuous practice because plants normally do not grow to their full potential as they are infected</p>



		by insects. This usually occurs due to late identification of the pests, since the cultivated region is spread over acres of land. This not only negatively affects the produce but also significantly reduces the amount of produce. So there is a need for monitoring crop health in order to prevent the losses in productivity and improving the quality of the agricultural product. The existing method for plants disease detection is simply naked eye observation which requires more man labour, properly equipped laboratories, expensive devices etc. This is time consuming and as well as very difficult. And improper disease detection may lead to inexperienced pesticide usage that can cause development of long term resistance of the pathogens, reducing the ability of the crop to fight back. Therefore, it is necessary to find a detection process which will be faster than the field inspection by experts.
5	Competitive Advantage or Unique Selling Proposition	
a	Process Improvement which Leads to Superior Product or Cost Reduction, Efficiency Improvement of the Whole Process (e.g. What is the issue is current process and what improvement you suggests)	Traditional methods are extremely time-consuming and require a human resource for visually observing the plant leaf patterns and diagnose the anomaly. The time consumption as well as difficult process of examining the fields can be made easy with use of drone with digital camera for survey of the area. This drone can be program to survey the selected area and capture images along its path. After the drone has completed its survey, images or video captured by the drone can be used to defect detection using thresholding then obtain a shortest route and perform disease identification, which helps the farmer to spray pesticides on a specific area optimally. This approach can save a lot of time and resources for the farmer and results in better yield.
b	Attainment of any SDG (e.g. How it is achieved and why it is necessary for the region)	SDG # 8, Decent work and Economic Growth. Our Project consists of two modules In the First Module we have identified the health of crops through high altitude images and applied Route optimization algorithms (Travelling salesman & Rotating caliper path planner) to obtain low altitude images and spraying pesticides. In the Second Module, we have identified the disease of that unhealthy part using a Convolutional Neural Network. Apart from this, we have also implemented the Disease Localization part using YOLOv3 to localize that diseased part to make it easier for the farmer to see. We have done the classification and Localization part by utilizing the free GPU of Colab
c	Any Environmental Aspect (e.g. carbon reduction, energy-efficient, etc.)	It will present the release of harmful greenhouse gases into the atmosphere and the eutrophication of our waterways
6	Target Market (Industries, Groups, Individuals, Families, Students, etc) Please provide some detail about the end-user of the product, process, or service	Targeting agricultural sector Farmers are the immediate end-user of our product.
7	Team Members (Names & Roll No.)	Areeba Naseer CS-108 Aqsa Zahoor CS-110 Sadia Razzaq CS-133

		Umama Nasir CS-135
8	Supervisor Name	Majida Kazmi
9	Supervisor Email Address	majidakazmi@neduet.edu.pk
10	Pictures (If any)	 <p>Optimal path for acquiring low altitude images and spraying the regions</p>  <p>Disease Identification and localization</p>
11	Video (If any)	FYP Video