

Disease Detection Project

Plant diseases posed an important problem as it reduced the quality and quantity of agricultural products, and at that moment made a negative use of the economies that primarily depend on agriculture. Observing plants for disease detection play a key role in successful plant cultivation. Currently, the most common method of monitoring plants is manual: experts observe plants and give their opinions about the disease at stake. This approach is based on the subjective judgment of experts. A scale from 1 to 10 is used to evaluate the disease, with 1 representing the complete absence of disease and 10 the total absence of leaves or the highest level of infection.

This approach can be very costly and time consuming depending on the number of plants that need to be evaluated. Very often, it takes extensive and physically exhausting work to be done at the field, that may be limited by weather conditions (high temperature, precipitation). Also, developing countries may find it difficult to reach experts who may be away from where the plants have to be evaluated.

The period when level of the disease has to be evaluated overlaps with other stages of the growing and breeding cycle. In the case of a rose, the stages are pollination, selection and evaluation of breeding material, grafting of superior material, harvesting of hips and seed extraction. Therefore, the search for fast, accurate and inexpensive plant disease detection methods - the process of automation - is of great importance.

The automation process aimed at eliminating the subjectivity of the assessor, increased the accuracy of the procedure, acceleration of the process itself and reduction of the cost. Pheno Geno Roses realized the project: "AUTOMATIC DETECTION OF ROSE DISEASE BASED ON IMAGE USING ARTIFICIAL NEURAL NETWORKS" in collaboration with the Faculty of Technical Sciences of Novi Sad and student Miloš Živković. Based on symptom photography for 4 diseases: powdery mildew, black spot, rust and downy mildew, an application for disease detection and recognition has been developed. The designed model of artificial neural networks had an accuracy of 90.56%.