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A Neuro-Automata Decision Support System for the Control of Late Blight in Tomato Crops

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Abstract : The use of decision support systems in agriculture may help monitoring large fields of crops by automatically detecting the symptoms of foliage diseases. In our work, we designed and implemented a decision support system for small tomatoes producers. This work investigates ways to recognize the late blight disease from the analysis of digital images of tomatoes, using a pair of multilayer perceptron neural networks. The networks outputs are used to generate repainted tomato images in which the injuries on the plant are highlighted, and to calculate the damage level of each plant. Those levels are then used to construct a situation map of a farm where a cellular automata simulates the outbreak evolution over the fields. The simulator can test different pesticides actions, helping in the decision on when to start the spraying and in the analysis of losses and gains of each choice of action.

Keywords : artificial neural networks, cellular automata, decision support system, pattern recognition
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