The article is entitled "Path recognition method of agricultural wheeled-mobile robot in shadow environment" and is written by Zhao Bo, Mao Wen Hua, Song Zheng He, Mao En Rong for International Conference on E-Health Networking, Digital Ecosystems and Technologies in 2010

The point of the article is to present a model of a neural network capable of navigating the robot in a shadow environment.

The main idea of an article is to extend suitable for agricultural robots conditions by applying Self-Organizing Map (SOM) neural network model to environment recognition process.

Article contains three parts, first one describes existing algorithm used to detect crop rows, whereas the second designated to actual description of SOM neural network model. Authors also show us experiment results in the third part.

Existing input processing method relies completely on image filtering algorithms. The whole process is done in 5 steps:

• Image convertation into grayscale

• Appliance of the iteration method

• Noise removal by erosion algorithm

• Acquirement of the centers of the crops row by the center line detecting algorithm

• Obtainment of the navigation lines by the Hough transformation algorithm

In the second part, authors provide examples of traditional path recognition algorithms incapability for correct crop row detection in shadow environment and describe Self-Organizing Map (SOM) neural network model. The image processing is done in 6 steps:

• Step 1: Initialize the weights randomly.

• Step 2: The eigenvectors is fed to the network through the processing elements (nodes) in the input layer.

• Step 3: Calculate the similitude between the input eigenvectors and the neurons weight.

• Step 4: Determinate the winning neuron, the node with the minimum distance respect to input eigenvectors is the winner.

• Step 5: Actualization of the weights of the winning neuron and its neighborhood, adjusting its weights to be closer to the value of the input pattern.

• Step 6: If it has got the maximum number of iterations, the learning process stops, in other case it returns to the step 2.

In conclusion, the authors provide readers with test results and report that the neural network model of a self-organizing map (SOM) has shown high path recognition efficiency in a shaded environment.