

ABSTRACT

The thesis is presenting a Kawasaki robotic system equipped with a spectrometer (SCIO) that can be used to establish the content of carbohydrates in fruits and vegetables. The fruits and vegetables are shifted on a conveyor belt while the spectrometer manipulated by the robotic arm performs the determination of their content of carbohydrates.

The results obtain by this procedure are transmitted to a mobilephone by cloud. Then, from the mobilephone they are transmitted to a php database, where they are statistically processed. This robotic system used for determining the content of carbohydrates in fruit and vegetables can be also used for marketing, confectionery, pastry or food industry.

The thesis follows along 7 chapters to introduce a short classification of robots, to underline the importance of establishing the chemical composition of fruits and vegetables, the actual stage of the researches in using the Raman spectrography in analyzing the chemical composition, biosensors, the actual stage of the systems used in the process of sorting and classification of fruits and vegetables, data bases for establishing the chemical composition of fruits and vegetables.

In the Chapters 8 and 9 it is presenting a robotic system with a pentalater mechanism (for which it has been made its synthesis) for guiding it in a required working space, the kinematic and dimensioning calculations for the pentalater mechanism, by using the Visual Basic programming and MS Office Excel application, a virtual and experimental model of a grab system with vaccum for fruits and vegetables. In order to verify the correctness of the dimensioning calculations, the mechanism was modeled in Catia V5 and it was simulated the kinematics movement results of the standard sizes.

In the Chapter 10 there are largely presented the most important original theoretical and experimental contributions and, also, the prospects for further research.