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ENHANCING QUALITY RESEARCH & INNOVATION for SOCIETAL DEVELOPMENT

PP-166 Practical Robut State Feedback Control Design for Automatic Gantry Crane System using Particle Swarm Optimization (PSO)

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Anti-swing control is required for achieving fast motion without sing motion in automatic gantry crane system. One of the possible solutions is based on anti-swing state feedback control. However, the problem of state feedback control design is conventionally solved by pole placement or linear quadratic regulator (LQR) method via Riccati equation. Unfortunately, they involve trial-and-error approach to specify some parameters needed for the control design. In particular, there is no unified approach to specify Q and R matrices in the state feedback control design using LQR method. The selection of Q and R matrices has no direct relation with the desired time domain response. Therefore, an intelligent-based method for state feedback control design is proposed by employing particle swarm optimization (PSO) algorithm. The close loop poles are prescribed within a specified wedge region whose parameters have direct relation with the desired time domain response. By maximizing the stability radius as the objective in the optimization, the stability robustness is guaranteed in the presence of plant uncertainties. The experimental results show the effectiveness of the proposed method. The controller is able to effectively follow the reference input of trolley position while suppressing the swing of the payload for various conditions of gantry crane operations.

PP-167 Processing of Date Palm Kernel (DPK) for Production of Edible Jam

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This project involved the usage of date palm (*Phoenix dactylifera*) kernel (DPK) to be produced as an edible jam after had been grounded into powder. DPK jams was prepared by adding date palm kernel (DPK) powder, saccharose, pectin, water, citric acid, ascorbic acid and Gum Arabic. Then the experiment design for date palm kernel (DPK) for production of jam was done using the Design Expert. The design shows that there were ten types of jams to be produce according to the content of different material where the parameters such as amount of saccharose, pectin and dietary fibre from Gum Arabic were varied to give the best acceptability of the DPK jams samples. After that the jams sample produce were evaluated in terms of the sensory evaluation which includes taste, texture, aroma, appearance and overall acceptability by the ten panelist selected from students of Biochemical-Biotechnology Engineering, International Islamic University Malaysia. The samples were evaluated based on a five point hedonic scale, where one represented ‘‘disliked extremely” and five represented ‘‘liked extremely”. All the data then were analyzed by using spreadsheet Microsoft Excel. From the result showed that some of the panelists accept the product while the others reject the DPK jam samples. Finally, this report is the outcome of the research done to find the acceptability of the production of DPK jams.

PP-168 Design and Development of Magneto Rheological (MR) Damper for Active Vibration Control

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Semi-active control devices have received significant attention in recent years because they offer the adaptability of active control devices without requiring the associated large power sources.

Magneto-rheological (MR) dampers are semi-active control devices that use MR fluids to produce controllable dampers. They potentially offer highly reliable operation and can be viewed as fail-safe in that they become passive dampers should the control hardware malfunction. To develop control