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Author: Mr. Joel Edmundo Morales Sánchez
Facultad de Ingeniería-UNAM, Mexico, joelms@comunidad.unam.mx

DESIGN AND DEVELOPMENT OF AN AUTONOMOUS CONTROL SYSTEM FOR A MICRO
LABORATORY ONBOARD A NANOSATELLITE**Abstract**

Nowadays there are micro laboratories onboard nanosatellites in order to make experiments in microgravity. In order to achieve the experiment successfully these micro laboratories require control of ambient conditions, this is made possible by onboard control modules.

In Mexico, CINVESTAV Monterrey and the Engineering Faculty of the UNAM are currently working in the development of a nanosatellite with an onboard microlaboratory in order to study the effects of microgravity on the mechanisms of aging using yeast as a model eukaryotic organism. This micro laboratory requires instrumentation and a control module in order to meet the requirements of the mission.

The proposal of this work is design and develop an autonomous control module with a neuro-fuzzy algorithm that monitor and control the micro laboratory experiment. The purpose of implementing a neuro-fuzzy control is that the neural network train the controller according to the state of the actuators and sensors. No matter if there is a change in the condition of the actuators, the neuro-fuzzy control is intended to compensate and adapt to the possible modifications of the system.