

Dedication

To My Parents

Acknowledgement

All praises are to Allah, Who taught human everything. His peace and blessings be on the prophet, his household and all those that follow the truth which he was sent with till the day of resurrection.

I would like to thank my parents for taking care of me.

I also like to thank my supervisor Dr. Jacqueline John George for her continuous support in the project until it reached this state. Finally, I thank Zoom Company that helped in providing the project components.

Abstract

The centrifuge is considered as an important device in modern life as it is used widely in various aspect of life such as in the medical and industrial field. The main idea of the device is based on the separation of the material from each other based on certain percentages. In the medical field it is used to separate the blood samples. In factories it is used to separate materials so as to have new ones, also it is used in filtering processes.

This research concentrates on the nuclear centrifuge that is used to separate isotopes from each other. The radioactive material radiated from the separation process affects the people working in the area. Therefore, a wireless controlled centrifuge was designed and implemented where the people working do not need to be in the same room as the centrifuge and the whole process can be done remotely.

This idea can be applied in all industrial processes related to centrifuge since it moves from the traditional control to automation.

التجريدة

تعتبر أجهزه الطرد المركزية من الاجهزة الهامة في حياتنا اليومية حيث تدخل في العديد من الإستخدامات التى يستفيد منها الإنسان سواء كانت هذه الإستخدامات صناعية او طبية ، حيث تبنى فكرته الأساسية على فصل المواد عن بعضها بنسب معينة .

فمن الناحية الطبية يستخدم لفصل عينات الدم ومن الناحية الصناعية يستخدم في المصانع في عمليات الفصل للمواد للحصول على مواد جديدة وكذلك في عمليات تنقية المواد والخ ...

هذا البحث ركز على أجهزة الطرد المركزية للمفاعلات النووية التى تقوم بفصل النظائر عن بعضها البعض . ونظراً للمخاطر الاشعاعية التى قد تضر بالانسان نتيجة لآلية الفصل أدخلت فكرة إستخدام أجهزة الارسال والاستقبال بحيث تقوم بالتحكم في جهاز الطرد عن بعد وبالتالي نقل من عمليات الاصابة بأمراض السرطان وهذه الفكرة يمكن أن تعمم على كل العمليات الصناعية الخاصة بأجهزة الطرد المركزية لانها تنقل الإنسان من فكرة التحكم التقليدي الى التحكم الآلي الحديث إيماناً منا بأن العالم يتجه نحو فكرة الأتمتة (Automation) في كل المجالات . لذلك حاولنا الربط بين علم الاتصالات وعلوم التحكم لتصميم جهاز الطرد والتحكم في سرعته حيث أن فكرة فصل المواد تعتمد على السرعة وعدد اللفات للجهاز وبالتالي

البحث ادخل فكرة جديدة للاجهزة الموجودة وهي فكرة التحكم من خلال استخدام تقنية التحكم اللاسلكي على هذه الاجهزة بشكل عام وحللت مشكلة التعرض للأشعة من هذا الجهاز بشكل خاص في المفاعلات النووية للوصول إلى النتيجة المطلوبة .

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