

قَالَ تَعَالَى: ﴿اللَّهُ لَا إِلَهَ إِلَّا هُوَ
 الْحَيُّ الْقَيُّومُ لَا تَأْخُذُهُ سِنَةٌ وَلَا
 نَوْمٌ لَهُ مَا فِي السَّمَاوَاتِ وَمَا فِي
 الْأَرْضِ مَنْ ذَا الَّذِي يَشْفَعُ عِنْدَهُ
 إِلَّا بِإِذْنِهِ يَعْلَمُ مَا بَيْنَ أَيْدِيهِمْ وَمَا
 خَلْفَهُمْ وَلَا يُحِيطُونَ بِشَيْءٍ مِّنْ
 عِلْمِهِ إِلَّا بِمَا شَاءَ وَسِعَ كُرْسِيُّهُ
 السَّمَاوَاتِ وَالْأَرْضَ وَلَا يَئُودُهُ
 حِفْظُهُمَا وَهُوَ الْعَلِيُّ الْعَظِيمُ ﴿

Dedication

O my lord! So order that I may be grateful for thy favors, which thou has bestowed on me and on my parents, and that I may work the righteousness that will please thee.

Acknowledgment

I am grateful to my supervisor Dr. Awadalla Taiyfour Ali who helped me with all hands and passed his knowledge with smile. My thanks to my friend Mr. Gaili El Sanous for his great support and ease the difficulties. Finally, I would like to thank all my family.

DESIGN

Abstract

Use of variable speed control to improve Induction Motor performance and efficiency has become the core of recent developments in the industry. Among conventional control methods the proportional integral controlling algorithm has earned wide respect since its effectiveness is sufficiently illustrated in real time applications.

In this research the idea is for a further perfection to the PI method. This is examined when combining the PI method with the fuzzy logic control. The choice of the fuzzy logic is based on its main feature; that its logic flow approaches real time situations more than most of the other known algorithms. The idea perfection is to provide an even more smooth control to the induction motor and to minimize deficiencies of the traditional PI method.

In this study a fuzzy controller will be designed for the three phase induction motor and treats the introduction of fuzzy logic control to the conventional PI control and investigates possible exploitations to this route. To achieve this objective, a fuzzy logic control model is developed. The simulation environment provided in the MATLAB Simulink is used to perform experimental analysis. The thesis paves the way for subsequent hardware implementation as an anticipated augmentation to this work.

المستخلص

استخدام التحكم فى السرعة لتحسين الأداء والكفاءة للمحرك الحثى أصبح من صميم التطورات الحديثة في الصناعة. ومن بين طرق التحكم التقليدية , نظام تحكم النسبة الثابتة (PI) كسب شهرة وثقة واسعة لفعاليته في تطبيقات الزمن الحقيقي.

هذا البحث هو سعى لتحسين هذه الطريقة و الذي يظهر عندما يتم الجمع بين نظام التحكم النسبة الثابتة (PI) مع التحكم بالمنطق الغامض (FLC). وأن اختيار المنطق الغامض كان بسبب الميزة الأساسية لهذا النظام ، وهي ان طريقة التدفق المنطقي تكون حالة زمن حقيقي اكثر من انظمة التحكم المعروفة الاخرى. والسعي لتحسين نظام التحكم هو ايضا لتوفير عنصر تحكم أكثر سلاسة للمحرك الحثي والحد من أوجه القصور في طريقة النسبة الثابتة التقليدية.

في هذه الدراسة جهاز التحكم الغامض سيصمم للمحرك الحثى ثلاثى الطور ويُعالجُ تَقديمَ سيطرة المنطق الضبابية إلى سيطرة النسبة الثابتة التقليدية ويتحرى إستغلالَ محتملَ إلى هذا الطريق. لإنجاز موضوعي ، و نموذج سيطرة منطق ضبابي متطور. تُستعملُ بيئة المحاكاة المدرجة في Matlab Simulink لإداء تحليل تجريبي. ثمهُدُ الإطروحةُ الطريق لتطبيق عملي كزيادة متوّقعة إلى هذا العمل.

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