

# **Dedication**

**To my parents, teachers and my family**

## **Acknowledgements**

I wish to express my deepest gratitude to my supervisor, Dr. El khawad Ali Elfaki , for his support, advice and guidance throughout the course of my research.

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# Abstract

Optimization of NC technology rests in selection of one optimal variant from several possible. Variant theoretically solved in CAD/CAM systems with aid of NC module of CAD/CAM system and module for simulation and verification of NC data minimizes costs of their creation and verification and brings qualitative basis for optimizing and decision process. This all then goes towards serious decreasing of costs and work expenditure not only in technology, but to costs decreasing of NC data debugging too.

In this research two products, namely, a plunger fixture and clamp fixture, were produced using CAD\CAM techniques with an optimization module.

The machining time for the plunger fixture is conventional milling machining with a copy attachment was calculated , theoretical and found to be equal to 10.687 hour . This time is must longer than the time taken to machine the clamp fixture using optimized CAD\CAM techniques IT took about 1.5 hour. to product the part using CAD\CAM .

## الخلاصة

الاستفادة المثلى من تكنولوجيا التحكم الرقمي NC تقع في اختيار واحده من البدائل المثلى من عدد ممكن من البدائل التي يمكن حلها نظريا في أنظمة ال CAD / CAM مع المساعدة من التحكم الرقمي NC ووحدة ال CAD / CAM. نظام وحدة المحاكاة والتحقق من التحكم الرقمي NC نجد ان البيانات تقلل من التكاليف الإنشائية . كل هذا يقود الى تناقص ملحوظ لتكاليف العمل ليس فقط في التكنولوجيا، ولكن إلى تقلص تكاليف البيانات للتحكم الرقمي NC .

في هذا البحث نجد ان هنالك اثنين من المنتجات، عباره عن كباس وفك قابض ، هذه المنتجات قد أنتجت باستخدام تقنيات ال CAD \ CAM مع التحسين. الزمن المتحصل عليه بالنسبة للفك فى ماكينة التفريز التقليدية للنسخه المرفقة حسب نظرياً ووجد انه يساوى 10.687 ساعة . هذه المدة يجب ان تكون أطول من الوقت المستغرق بالنسبة للفك عند استخدام التقنية المحسنة بواسطة التصميم و التصنيع باستخدام الحاسوب حيث وجدت تعادل 1.5 ساعة لإنتاج هذا الجزء عند استخدام التصميم و التصنيع باستخدام الحاسوب .

## List of symbol

APT.....	Automatically program tools
NC.....	Numerical control
CIE .....	Computer Integrated Engineering
CIM.....	Computer Integrated Manufacturing
CNC.....	Computer numerically control
CAD.....	Computer added design
CAM.....	Computer added Manufacturing
GPSS.....	General Purpose Simulation System
CMR.....	Command Multiply Ratio
DMR.....	Detect multiple ratio
MPG.....	Manual pulse generator
AC.....	Alternating Current
DC .....	Direct Current
2D.....	Two dimension
3D.....	Three dimension
EDM.....	electrical discharge machining

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