BUSITEMA UNIVERSITY

FACULTY OF ENGINEERING

DEPARTMENT OF TEXTILE AND GINNING

MODELLING THE BREAKING STRENGTH OF PC BLENDS ROTOR SPUN YARN

BY

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FINAL YEAR PROJECT REPORT FOR NASSANGA AISHA

DECLARATION

I NASSANGA AISHA Reg. No BU/UG/2014/99 hereby declare that this project is my original work and that the information contained in this project is out of my hard work and research, except where explicit citation has been made and it has not been presented to any Institution of higher learning for any academic award.

Signature .....

Date.....10th/7/2018.....

APPROVAL

This is to certify that the proposal under the title "*modeling the breaking strength of PC blend rotor spun yarn*" has been proposed under my supervision and is now ready for examination.

Supervisors;

Name: Dr .NIBIKORA Ildephonse

Signature: .....

Date: .....

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Signature: .....

Date: .....

ACKNOWLEDGEMENT

I would love to extend my gratitude to a number of people who have managed to contribute towards my education.

I would like to thank the almighty God for giving me the strength to do this project .i recognize the support from the entire textile department.

I also acknowledge the love and care of my family and loved ones, for all the financial, moral,

Spiritual, and physical support.

DEDICATION

I dedicate this project to my family in particular my lovely son and husband who have been there for the in the times when I needed them most along with my lovely parents who have supported me since the journey began, my head of department who has been so supportive in the accomplishment of this project.

ABSTRACT

In this study, SVM as a new intelligent methodology was applied to obtain a predictive model of strength of polyester cotton rotor spun yams based on three main parameters; the rotor speed, the count and blend ratio. And linear regression model was also used in my study as a criterion to evaluate the predictive power of the SVM algorithm.
Obtained results from the tests of the study indicated a powerful performance of the linear regression programming algorithm in predicting the strength of rotor spun yarns with the R2 values of the SVM model and linear regression model were 27.74% and 99.97% respectively. Other relations are showed in the table III. The 27.74% value of R2 of the SYM shows a very weak relationship between the actual and predicted values as it is less than 50% and hence conclusively, the SVM model for predicting yarn strength was modelled.

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SVM-Support Vector Machines

PC-PolyesterCotton

MODELLING THE BREAKING STRENGTH OF PC BLENDS ROTOR SPUN YARN

1.0 CHAPTER ONE

1.1 Introduction

1.11 Rotor spinning

Among the range of open-end spinning technologies, rotor spinning is commercially more widely used because a wider range of yarn counts can be spun with appropriate yarn properties. Since its commercial introduction in 1969, rotor spinning has developed continuously. Rotor speeds have increased from around 30,000 rpm to over 150,000 rpm. Rotor spinning was initially developed with two main objectives:

1. To provide a more economical spinning system than conventional ring spinning through higher productivity
2. To produce yarn of a quality that matches or surpasses that of conventional ring spinning

The first objective has been accomplished. Today, rotor spinning has a production rate exceeding 200 m/min, as compared to a maximum of about 40 m/min in ring spinning. Rotor spinning eliminates the need for roving, since rotor yarns can be spun directly from drawn sliver. Unlike in a ring frame, the winding and twisting functions are separate and this permits the building of large yarn packages. Both these characteristics allow much high levels of productivity than with ring spinning. The second objective has not yet been achieved because of the structure of rotor yarns, which also limits the fineness of count that can be spun. Perhaps the biggest current obstacle facing rotor spinning is the fact that it is limited to coarse and medium yarn counts (16tex to 120tex) while ring spinning excels in the medium to fine counts (finer than 16tex).

The rotor spinning machine is unlike any other machine in the short staple spinning mill in the range of tasks it has to perform, namely all the basic operations:

- **Sliver feed**: A card or drawframe sliver is fed through a sliver guide via a feed roller and feed table to a rapidly rotating opening roller.
- **Sliver opening**: The rotating teeth of the opening roller comb out the individual fibers from the sliver clamped between feed table and feed roller. After leaving the rotating opening roller, the fibers are fed to the fiber channel.
- **Fiber transport to the rotor:** Centrifugal forces and a vacuum in the rotor housing cause the fibers to disengage at a certain point from the opening roller and to move via the fiber channel to the inside wall of the rotor.

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