REPUBLIC OF TURKEY
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NAME SURNAME

MASTER OF SCIENCE THESIS
ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT

SUPERVISOR
PROF. DR. …….

DUZCE, 2020

REPUBLIC OF TURKEY
DUZCE UNIVERSITY
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A thesis submitted by ---------- in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE** is approved by the committee in Department of ……..

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Duzce Unıversity

Co-Advisor (If available)

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Duzce Unıversity

Examining Committee

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DECLARATION

This thesis study is my own work, I do not have unethical behavior in all stages from the planning to the writing of the thesis, that I have obtained all the information in this thesis within academic and ethical rules, that I refer to all the information and comments that have not been obtained with this thesis and that I have included these sources in the list of references. I declare that I did not violate patent and copyright rights during the study and writing of this thesis.

12 September 2020

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ACKNOWLEDGMENTS

I would like to thank my dear Prof. Dr. ……. for all kinds of support and assistance in my master's education and in the preparation of this thesis.

I would like to express my gratitude to my co-advisor Prof. Dr. ……. for her valuable contribution throughout my thesis.

I would like to express my endless thanks to my dear family and colleagues for their help and support throughout this work.

This study was supported by, Duzce Unıversity BAP under grant no XXX-WWW (This statement must be written here if the thesis is supported by Duzce University).

12 September 2020 **Name Surname**

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LIST OF ABBREVIATIONS

CCM	Continuous conduction mode
FC	Fuel cell
PWM	Pulse width modulation
SRM	Switched reluctance machine
VRLA	Valve regulated lead acid

LIST OF SYMBOLS

G	Conductivity
P	Power
S	Siemens
Ω	Ohm

ABSTRACT

THESIS TITLE GOES THERE

Student Name SURNAME
Duzce University
Graduate School of Natural and Applied Sciences, Department of ……..
Master's Thesis
Supervisor: Prof. Dr……..
September 2020, 18 pages

The English summary of the thesis should be written here in one paragraph. The English summary of the thesis should be written here in one paragraph. The English summary of the thesis should be written here in one paragraph. Try not to exceed 1 page.

Keywords: Keyword one, Keyword two, Keyword three. (Up to five keywords)

ÖZET

BURAYA TEZ BAŞLIĞI YAZILMALIDIR

Öğrenci ADI
Düzce Üniversitesi
Fen Bilimleri Enstitüsü, …… Anabilim Dalı
Yüksek Lisans Tezi
Danışman: Prof. Dr. ……
Eylül 2020, 18 sayfa

Buraya tezin özeti bir paragraf olacak şekilde yazılmalıdır. Buraya tezin özeti bir paragraf olacak şekilde yazılmalıdır. 1 sayfayı aşmamaya çalışılmalıdır.

Anahtar sözcükler: Anahtar sözcük bir, Anahtar sözcük iki, Anahtar sözcük üç. (en fazla 5 tane)

1. INTRODUCTION

This thesis template is created based on thesis rules. For detailed information, please take a look at Thesis Manual.

(INTRODUCTION IS MANDATORY).

This section includes literature review, aim of the study and contributions to the literature.

2. SECTION 2

Number of sections can be increased to any number.

Figure 2.1. Landscape 1.

Figure 2.2. Landscape 2.

Table 2.1. Units 1.

System	Mass (m)	Acceleration (a)	Force (F)
SI	kg	m/s^2	kg m/s^2 (N)
cgs	g	cm/s^2	g cm/s^2 (dyn)

Table 2.2. Units 2.

System	Mass (m)	Acceleration (a)	Force (F)
SI	kg	m/s^2	kg m/s^2 (N)
cgs	g	cm/s^2	g cm/s^2 (dyn)

There must be 1.5 spacing between a paragraph and a sequent figure.

a) İstanbul b) Eminönü c) Galata bridge

Figure 2.3. Landscape 3 a) İstanbul b) Eminönü c) Galata bridge.

Paragraph.

2.1. SUBHEADING 1

Paragraph.

$$\theta(t) \in R: \ \underline{\theta}_i \le \theta(t) \le \overline{\theta}_i, \ \forall i = 1,2,...,n \tag{2.1}$$

$$\theta(t) \in R: \ \underline{\theta}_i \le \theta(t) \le \overline{\theta}_i, \ \forall i = 1,2,...,n \tag{2.2}$$

Equation (2.2) shows that……

2.1.1. Subheading 2

Paragraph.

2.1.1.1. *Subheading 3*

Paragraph

2.1.1.2. *Subheading 3*

Paragraph.

Paragraph.

2.1.2. Subheading 2

2.2. SUBHEADING 1

Paragraph.

3. SECTION 2

Number of sections can be increased.

Figure 3.1. Landscape 4.

Figure 3.2. Landscape 5.

Table 3.1. Units 3.

System	Mass (m)	Acceleration (a)	Force (F)
SI	kg	m/s^2	kg m/s^2 (N)
cgs	g	cm/s^2	g cm/s^2 (dyn)

Table 3.2. Units 4.

System	Mass (m)	Acceleration (a)	Force (F)
SI	kg	m/s^2	kg m/s^2 (N)
cgs	g	cm/s^2	g cm/s^2 (dyn)

There must be 1.5 spacing between a paragraph and a sequent figure.

Figure 3.3. Landscape 6.

Paragraph.

3.1. SUBHEADING 1

Paragraph.

$$\theta(t) \in R:\ \underline{\theta}_i \le \theta(t) \le \overline{\theta}_i,\ \forall i = 1,2,...,n \tag{3.1}$$

$$\theta(t) \in R:\ \underline{\theta}_i \le \theta(t) \le \overline{\theta}_i,\ \forall i = 1,2,...,n \tag{3.2}$$

Equation (2.2) shows that……

3.1.1. Subheading 2

Paragraph.

3.1.1.1. *Subheading 3*

Paragraph

3.1.1.2. *Subheading 3*

Paragraph.

3.1.2. Subheading 2

3.2. SUBHEADING 1

Paragraph.

4. FINDINGS AND DISCUSSIONS

In this section, obtained findings and related discussions can be written (This section is optional).

Table 4.1. Results 1.

R_s	10mΩ
L	100mH

Paragraph.

4.1. SUBHEADING 1

Paragraph.

4.1.1. Subheading 2

Paragraph.

4.2. SUBHEADING 1

4.2.1. Subheading 2

Paragraph.

4.2.1.1. *Subheading 3*

Paragraph.

Table 4.2. Results 2.

R_s	10mΩ
L	100mH

Paragraph.

5. CITATION METHODS

Referring to a source document in the text must be done by Numerical Citation Method or Harvard Citation Method (Surname-Year).

FOR CITATIONS AND CREATING A REFERENCE LIST, YOU ARE STRONGLY ADVISED TO EXAMINE THESIS MANUAL. FURTHERMORE, THERE ARE A TUTORIAL OF USING THE MENDELEY CITATION SOFTWARE AND RELATED VIDEO LINKS.

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The bibliography based on Numerical Citation Method is arranged by the order in which the citations appear in the text. In case of creating the bibliography by Mendeley software, IEEE style must be chosen.

[1] G. Pipeleers, B. Demeulenaere, J. Swevers, and L. Vandenberghe, "Systems & Control Letters Extended LMI characterizations for stability and performance of linear systems", Systems & Control Letters, 58(7), pp. 510–518, 2009.

[2] B. Lu, F. Wu, and S. W. Kim, "Switching LPV control of an F-16 aircraft via controller state reset", IEEE Transactions on Control Systems Technology, 14(2), pp. 267–277, 2006.

[3] V. Q. Leu, H. H. Choi, and J. W. Jung, "Fuzzy sliding mode speed controller for PM synchronous motors with a load torque observer", IEEE Transactions on Power Electronics, 27(3), pp. 1530–1539, 2012.

[4] M. Alma, J. J. Martinez, I. D. Landau, and G. Buche, "Design and tuning of reduced order H-infinity feedforward compensators for active vibration control", IEEE Transactions on Control Systems Technology, 20(2), pp. 554–561, 2012.

[5] K. Graichen, M. Treuer, and M. Zeitz, "Swing-up of the double pendulum on a cart by feedforward and feedback control with experimental validation", Automatica, 43(1), pp. 63–71, 2007.

[6] X. Litrico, V. Fromion, and G. Scorletti, "Robust feedforward boundary control of hyperbolic conservation laws", Proceedings of the 45th IEEE Conference on Decision and Control, pp. 5311–5316, 2006.

[7] I. Masubuchi and I. Kurata, "Gain-scheduled control via filtered scheduling parameters", Automatica, 47(8), pp. 1821–1826, 2011.

5.2. BIBLIOGRAPHY BASED ON HARVARD CITATION METHOD

The bibliography must be created according to Harvard Citation Method rules. In-text citations contain the author(s)'s or editor(s)'s surname, year of publication and page number(s). In the Mendeley, the style must be Harvard Educational Review.

Agharkakli, A., Sabet, G., & Barouz, A. (2012). Simulation and analysis of passive and active suspension system using quarter car model for different road profile. *International Journal of Engineering Trends and Technology*, *3*(5), 636–644.

Altun, Y. (2017). The road disturbance attenuation for quarter car active suspension system via a new static two-degree-of-freedom design. *An International Journal of Optimization and Control: Theories & Applications (IJOCTA)*, *7*(2), 142–148.

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Chowdhury, D., Chattopadhyay, M., Roy, P., Lynch, K. M., Marchuk, N., Elwin, M. L., … Manikandan, B. V. (2015). Speed control of Brushless DC motor using bat algorithm optimized Adaptive Neuro-Fuzzy Inference System. *Embedded Computing and Mechatronics with the PIC32*, *32*, 279–285.

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Lauwerys, C., Swevers, J., & Sas, P. (2005). Robust linear control of an active suspension on a quarter car test-rig. *Control Engineering Practice*, *13*(5), 577–586.

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Sinthipsomboon, K., Hunsacharoonroj, I., Khedari, J., Pongaen, W., & Pratumsuwan, P. (2011). A hybrid of fuzzy and fuzzy self-tuning PID controller for servo electro-hydraulic system. Içinde *Proceedings of the 2011 6th IEEE Conference on Industrial Electronics and Applications, ICIEA 2011* (pp. 220–225).

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Zhao, P., & Nagamune, R. (2018). Discrete-Time State-Feedback Switching LPV Control with Separate Lyapunov Functions for Stability and Local Performance. Içinde *2018 Annual American Control Conference (ACC)* (pp. 2023–2028).

Zheng, J. ming, Zhao, S. dun, & Wei, S. guo. (2009). Application of self-tuning fuzzy PID controller for a SRM direct drive volume control hydraulic press. *Control Engineering Practice*, *17*(12), pp. 1398–1404.

Journals:

Agharkakli, A., Sabet, G., & Barouz, A. (2012). Simulation and analysis of passive and active suspension system using quarter car model for different road profile. *International Journal of Engineering Trends and Technology*, *3*(5), pp. 636–644.

Zheng, J. ming, Zhao, S. dun, & Wei, S. guo. (2009). Application of self-tuning fuzzy PID controller for a SRM direct drive volume control hydraulic press. *Control Engineering Practice*, *17*(12), pp. 1398–1404.

Conference papers:

Altun, Y., Erol, O., & Aktaş, M. (2017). Simulation and Analysis of Hydraulic-Pneumatic Quadruple Tank System. Içinde *International Conference on Hydraulics, Pneumatics, Tools, Sealing Elements, Fine Mechanics, Specific Electronic Equipment &*

Sinthipsomboon, K., Hunsacharoonroj, I., Khedari, J., Pongaen, W., & Pratumsuwan, P. (2011). A hybrid of fuzzy and fuzzy self-tuning PID controller for servo electro-hydraulic system. Içinde *Proceedings of the 2011 6th IEEE Conference on Industrial Electronics and Applications, ICIEA 2011* (pp. 220–225).

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Books:

Feng, Y., & Yagoubi, M. (2017). Dilated Linear Matrix Inequalities. Içinde *Robust Control of Linear Descriptor Systems* (pp. 23–43). Springer.

6. CONCLUSIONS AND RECOMMENDATIONS

(THIS SECTION IS MANDATORY).

In the light of the information obtained, the conclusion / results should be written in a clear, concise and understandable manner. If the researcher has a suggestion, it should be stated. The suggestions to be made should be directly related to the purpose and results of the research. Figures and tables are not included in this section.

.

7. REFERENCES

[1] B. Lu, F. Wu, and S. W. Kim, "Switching LPV control of an F-16 aircraft via controller state reset", *IEEE Transactions on Control Systems Technology*, 14(2), pp. 267–277, 2006.

[2] V. Q. Leu, H. H. Choi, and J. W. Jung, "Fuzzy sliding mode speed controller for PM synchronous motors with a load torque observer", *IEEE Transactions on Power Electronics*, 27(3), pp. 1530–1539, 2012.

[3] M. Alma, J. J. Martinez, I. D. Landau, and G. Buche, "Design and tuning of reduced order H-infinity feedforward compensators for active vibration control", *IEEE Transactions on Control Systems Technology*, 20(2), pp. 554–561, 2012.

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[5] X. Litrico, V. Fromion, and G. Scorletti, "Robust feedforward boundary control of hyperbolic conservation laws", *Proceedings of the 45th IEEE Conference on Decision and Control*, pp. 5311–5316, 2006.

[6] I. Masubuchi and I. Kurata, "Gain-scheduled control via filtered scheduling parameters", *Automatica*, 47(8), pp. 1821–1826, 2011.

8. APPANDICES

8.1. APPENDIX 1: HEADING 1

This section is where the Appendices are located. Titles along with all equations, figures and tables here must be arranged in ascending order as in other sections.

Paragraph.

$$\theta(t) \in R:\ \underline{\theta}_i \le \theta(t) \le \overline{\theta}_i,\ \forall i = 1,2,...,n \tag{8.1}$$

$$\theta(t) \in R:\ \underline{\theta}_i \le \theta(t) \le \overline{\theta}_i,\ \forall i = 1,2,...,n \tag{8.2}$$

Paragraf.

$$\theta(t) \in R:\ \underline{\theta}_i \le \theta(t) \le \overline{\theta}_i,\ \forall i = 1,2,...,n \tag{8.3}$$

Paragraph.

Figure 8.1. Landscape 7.

Paragraph.

Table 8.1. Units 5.

System	Mass (m)	Acceleration (a)	Force (F)
SI	kg	m/s^2	kg m/s^2 (N)

cgs	g	cm/s^2	g cm/s^2 (dyn)

Paragraph.

Figure 8.2. Landscape 8.

Figure 8.3. Landscape 9.

8.2. APPENDIX 2: HEADING 1

This section is where the Appendices are located. Titles along with all equations, figures and tables here must be arranged in ascending order as in other sections.

Paragraph.

$$\theta(t) \in R: \ \underline{\theta}_i \le \theta(t) \le \overline{\theta}_i, \ \forall i = 1,2,...,n \tag{8.4}$$

$$\theta(t) \in R: \ \underline{\theta}_i \le \theta(t) \le \overline{\theta}_i, \ \forall i = 1,2,...,n \tag{8.5}$$

Paragraf.

$$\theta(t) \in R: \ \underline{\theta}_i \le \theta(t) \le \overline{\theta}_i, \ \forall i = 1,2,...,n \tag{8.6}$$

Paragraph.

Figure 8.4. Landscape 10.

Paragraph.

Table 8.2. Units 6.

System	Mass (m)	Acceleration (a)	Force (F)
SI	kg	m/s^2	kg m/s^2 (N)
cgs	g	cm/s^2	g cm/s^2 (dyn)

Açıklama [a1]: (ÇİZELGE, ŞEKİL VE DENKLEM NUMARALARI OTOMATİK OLARAK ARTMAKTADIR. SADECE BUNLARI TEKRAR KOPYALAYIP ÇOĞALTABİLİRSİNİZ. DEĞİŞİKLİKLERİ GÜNCELLEMEK İÇİN BASKI ÖNİZLE( ) SİMGESİNE TIKLAMANIZ YETERLİDİR) [Bu açıklama notlarını silmek için sağ tuş açıklamayı sil seçeneğini tıklamanız yeterlidir.]

Paragraph.

Figure 8.5. Landscape 11.

Figure 8.6. Landscape 12.

CURRICULUM VITAE

PERSONEL INFORMATIONS

Name Surname :

Date of birth and birthplace :

Foreign language :

E-mail :

EDUCATION BACKGROUND

Degree	Field	School/University	Year of Graduation
Master of Science	Electrical-Electronics Eng.	…University	2012
Under Graduate	Electrical-Electronics Eng.	… University	2010
Highscool		… Highschool	2006

PUBLISHMENTS

WORK EXPERIENCES

Year	Corporation/Institute	Enrollment
2010-2012	Duzce University	Research Asistant