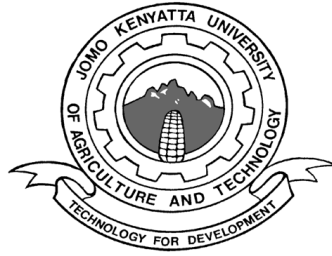


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Jomo Kenyatta University of Agriculture and Technology

College of Engineering and Technology

School of Mechanical, Materials, and Manufacturing Engineering

Department of Mechatronic Engineering

Design and Fabrication of a Digital Stethoscope (FYP 17-11)

Project Proposal

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May 2021

Declaration

We hereby declare that the work contained in this report is original; researched and documented by the undersigned students. It has not been used or presented elsewhere in any form for award of any academic qualification or otherwise. Any material obtained from other parties have been duly acknowledged. We have ensured that no violation of copyright or intellectual property rights have been committed.

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Acknowledgment

I will acknowledge you later. For now, it is assumed that by now you know how to work in the latex environment. You will therefore be expected to correct the document by removing the first page that is blank. Thereafter, you will replace the university logo with the correct one. Create your own .bib file and use it in your text. Appendices can be appended. Look up the process of adding appendices to your document. As for the rest of the sectioning, remember the key differences between a proposal and a report. As usual, some students will not even see these instructions, let alone read! Do not be one of them. Wishing you all the best with your project.

Abstract

This project

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1 Introduction

This document is supposed to help the students learn how to structure their reports. Some parts may therefore not make sense, such as the references. A Stethoscope is an acoustic medical device used for auscultation of internal body sounds [?]. The word stethoscope is derived from the two Greek words; *Stethos* meaning Chest and *Scopos* meaning Examination. It is not only used for heart sounds but also used to listen to lung sounds, bowel movements and pulse noises in the arteries and veins. The stethoscope is perhaps the most iconic device associated with medical practice. A 2012 research paper claimed that the stethoscope, when compared to other medical equipment, had the highest positive impact on the perceived trustworthiness of the practitioner seen with it [?].

ow of blood into the heart making the semilunar valves to snap shut thus producing S2.

1.1 Abnomalities

However, there could be abnormalities by having other heart sounds apart from S1 and S2; which are S3 and S4. S3 is caused by a deceleration of blood ow which correlates to a volume overload in the ventricles [?]. This is a sign of the High Blood Pressure condition. S4 on the other hand is caused by the vibration of valves, supporting structures and the ventricular walls; which is a symptom of heart failure. These abnormalities are usually detectable since they vary in frequency and duration from the normal S1 and S2. According to Macchi and Fumagalli [?], presence of unusual heart murmurs may also be detected as abnormalities since they mainly arise from heart problems and diseases. Chen [?] stated that during heart auscultation, medics look for these abnormalities and unusual murmurs. This can be achieved using a Stethoscope.

1.1.1 S1 and S2

According to Macchi and Fumagalli [?], presence of unusual heart murmurs may also be detected as abnormalities since they mainly arise from heart problems and diseases.

1.1.2 S3 and S4

This is a sign of the High Blood Pressure condition. S4 on the other hand is caused by the vibration of valves, supporting structures and the ventricular walls; which is a symptom of heart failure. These abnormalities are usually detectable since they vary in frequency and duration from the normal S1 and S2.

1.2 Recap

As can be seen here, we are repeating ourselves. his is a sign of the High Blood Pressure condition. S4 on the other hand is caused by the vibration of valves, supporting structures and the ventricular walls; which is a symptom of heart failure. These abnormalities are usually detectable since they vary in frequency and duration from the normal S1 and S2.

1.2.1 S5 and S6

According to Macchi and Fumagalli [?], presence of unusual heart murmurs may also be detected as abnormalities since they mainly arise from heart problems and diseases.

1.2.2 S7 and S8

This is a sign of the High Blood Pressure condition. S4 on the other hand is caused by the vibration of valves, supporting structures and the ventricular walls; which is a symptom of heart failure. These abnormalities are usually detectable since they vary in frequency and duration from the normal S1 and S2.

2 Literature Review

Itemization

- Item 1.
- Item 2.
- ...

$$\dot{x} = Ax + Bu + B_d w \tag{2.1}$$

Referring a chapter in the main text. For instance Chapter 2

$$E = 210000 \frac{\text{N}}{\text{mm}^2}$$

$$\rho = 7,85 \frac{\text{g}}{\text{cm}^3} = 7850 \frac{\text{kg}}{\text{m}^3}.$$

$$\Delta \boldsymbol{r}_k = \boldsymbol{r}_{\text{GBE}_k} - \boldsymbol{r}_{\text{C}_k} = (x_{\text{GBE}_k} - x_{\text{C}_k}, y_{\text{GBE}_k} - y_{\text{C}_k})^T = (\Delta x_k, \Delta y_k)^T \tag{2.2}$$

$$k = 2 \dots n$$

$$||\boldsymbol{r}_{\text{GBE}_k} - \boldsymbol{r}_{\text{C}_k}|| \leq r_{kj}, \tag{2.3}$$

$$k \ j$$

Table 2.1: Caption for the table should be at the top of the table

It can also overflow to next line

First column	Second column	Third column
1	2	4
4	6	23
34	2	0

$$\text{rank } \boldsymbol{Q}_B = \text{rank} \begin{bmatrix} \boldsymbol{C} \\ \boldsymbol{CA} \\ \boldsymbol{CA}^2 \\ \vdots \\ \boldsymbol{CA}^{n-1} \end{bmatrix} = n.$$

(2.4)

$$K_\varphi \; = \; 3.64 \, \frac{\text{V}}{\text{rad}} \quad \text{and}$$

(2.5)

$$K_x \; = \; 28.32 \, \frac{\text{V}}{\text{m}}.$$

(2.6)

2.1 Name of a subsection

q_1, q_2 and q_3 (see Fig. ??).

2.2 Another subsection

3 Methodology

This is how you cite literature in the main text. For instance a Journal paper by Boone and Boone is cited as [?]. It is reported in [?] (A book).

4 Results and Discussion

5 Summary, Conclusion, and Future Work

References

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Time plan

Insert Gantt chart here

Budget

Insert table here