ABSURDLY LONG THESIS TITLE WRITTEN IN ALL CAPS

A thesis submitted in partial fulfillment of the requirements for the award of the degree of

B.Tech

in

Comupter Science and Engineering

By

Sachin A (106114003)

Parth Thakkar (106114062)

Shilpa Sweth (106114087)

COMUPTER SCIENCE AND ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY
TIRUCHIRAPPALLI-620015

MAY 2018

BONAFIDE CERTIFICATE

This is to certify that the project titled **ABSURDLY LONG THESIS TITLE WRITTEN IN ALL CAPS** is a bonafide record of the work done by

Sachin A (106114003)
Parth Thakkar (106114062)
Shilpa Sweth (106114087)

in partial fulfillment of the requirements for the award of the degree of **Bachelor of Technology** in **Comupter Science and Engineering** of the **NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**, during the year 2017-2018.

Name of Guide	**Name of HOD**
Guide	Head of the Department

Project Viva-voce held on _____

Internal Examiner **External Examiner**

ABSTRACT

Removal of colour from industrial wastewater can be achieved by extraction using liquid emulsion membrane. A dye, named, Crystal Violet (CV) is extracted using water/oil/water liquid emulsion membrane. An experiment on single dye component is carried out. A stable emulsion is formed by agitating NaOH solution and an organic solvent (n-hexane) at high speed. Span 80 (surfactant) is used to stabilize the membrane. Extraction is carried out by dispersing the emulsion in an external water phase (feed) at lower speed resulting in the formation of small globules thereby increasing surface area and providing better extraction. The constituent (dye) to be extracted from the external phase diffuses through the membrane phase into the internal phase (NaOH solution). Reaction occurs in the internal phase resulting in the formation of sodium salt of the dye (s). The emulsion can be reused after demulsification. During extraction, the effect of Span 80, NaOH concentration, n-hexane, stirring speed and feed concentration have been investigated. The main objective of this study is to find the optimum operating conditions for the extraction of crystal violet.

Keywords: Emulsion; Internal phase; Extraction; Diffusion; Dye separation

ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION

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1.1.1 A Subsection

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Table 1.1 is really awesome and I like it.

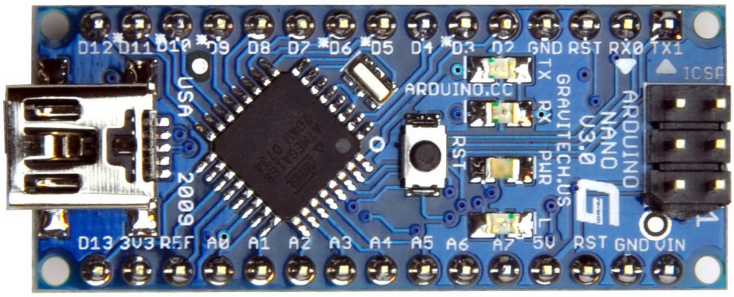

Figure 1.1: This is Arduino Nano

The table 1.1 is an example of referenced LaTeXelements.

Table 1.1: Table to test captions and labels

Col1	Col2	Col2	Col3
1	6	87837	787
2	7	78	5415
3	545	778	7507
4	545	18744	7560
5	88	788	6344

1.2 ANOTHER SECTION

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Figure 1.2: This is a servo controller.

Single equation

$$e^{i\pi} = -1 \tag{1.1}$$

Multiple equations

$$\text{State Vector: } x = \begin{bmatrix} q & \vec{\omega} \end{bmatrix}^T \tag{1.2}$$

$$\text{Process Model: } x_{k+1} = A(x_k, w_k) = \begin{bmatrix} q_k q_w q_\Delta \\ \omega_k \end{bmatrix} \tag{1.3}$$

$$\text{Measurement Model: } z_k = H(x_k, v_k) = \begin{bmatrix} q_k g q_k^* + \vec{v}_{acc} \\ \vec{\omega}_k + \vec{v}_{rot} \end{bmatrix} \tag{1.4}$$

This is an example of how you can reference an image. This sentence is referring to the Figure 1.3

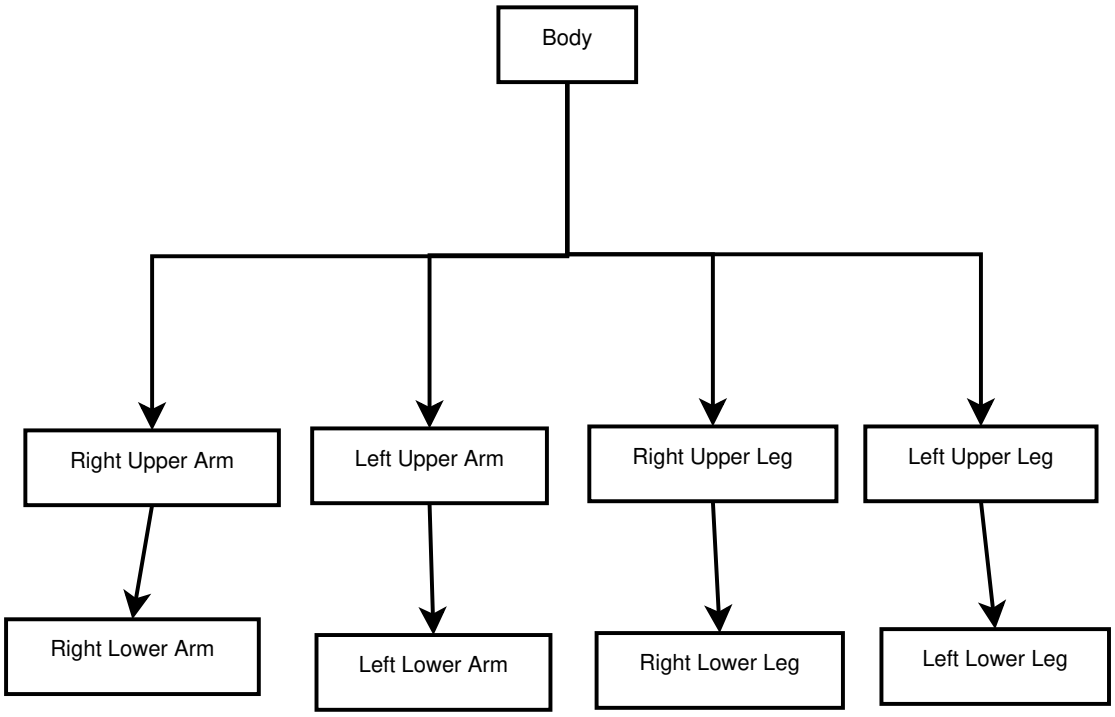

Figure 1.3: This is some awesome thing.

CHAPTER 2

IMPLEMENTATION

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2.1 A SECTION

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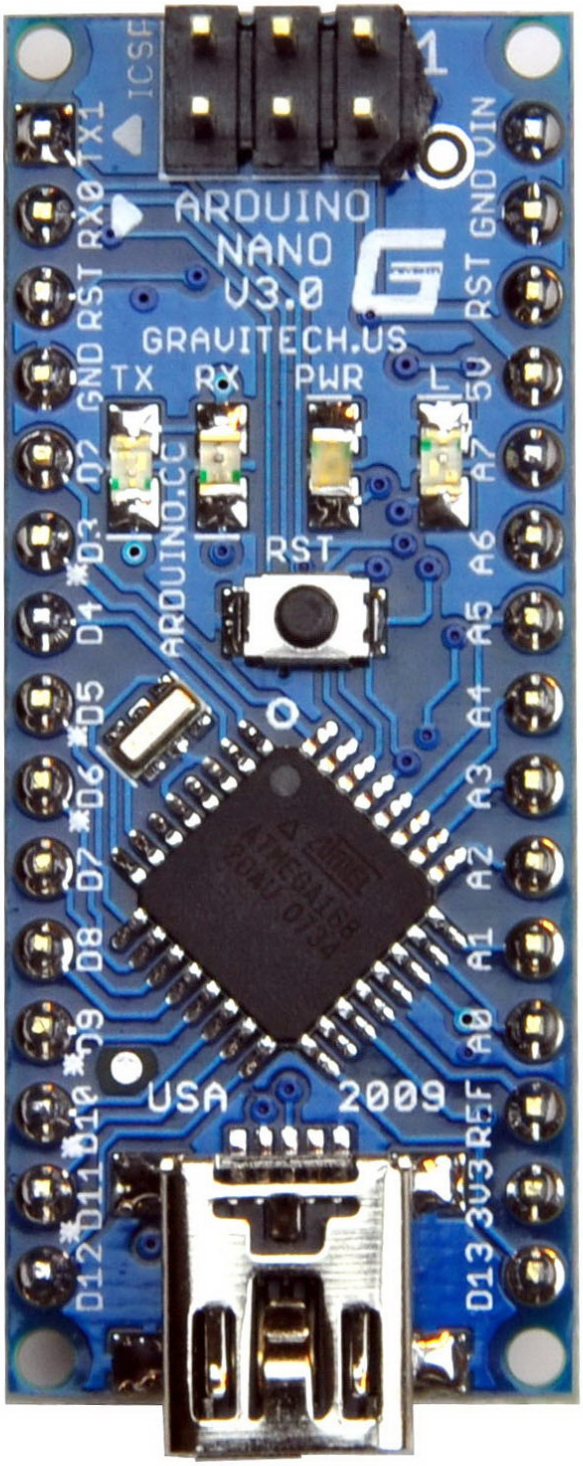

Figure 2.1: This is Arduino Nano

2.1.2 B Sub-Section

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Single equation

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Multiple equations

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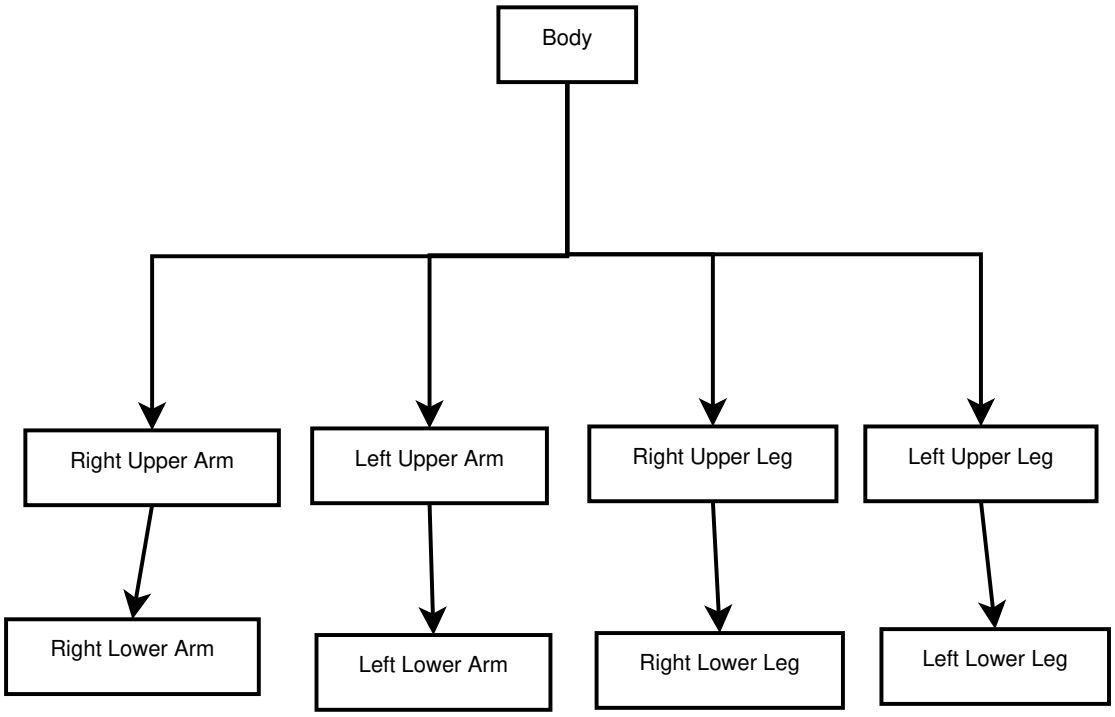

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[1] Alex Graves, Abdel-rahman Mohamed, and Geoffrey Hinton. Speech recognition with deep recurrent neural networks. In *Acoustics, Speech and Signal Processing (ICASSP), 2013 IEEE International Conference on*, pages 6645–6649. IEEE, 2013.

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