Slit Diffraction Experiment

Design Document

Names Mohamed Mohamed

Date 11/05/2015

Contents

[1. Introduction 3](#_Toc402433840)

[a. Purpose 3](#_Toc402433841)

[b. Scope 3](#_Toc402433842)

[c. Definitions and Acronyms 3](#_Toc402433843)

[2. System Overview 3](#_Toc402433844)

[3. System Architecture 3](#_Toc402433845)

[a. Architectural Design 3](#_Toc402433846)

[b. Design Rationale 3](#_Toc402433847)

[4. Human Interface Design 3](#_Toc402433848)

[a. Overview of User Interface 3](#_Toc402433849)

[b. Screen Images 3](#_Toc402433850)

# Introduction

## Purpose

Diffraction is a phenomena that occurs when waves encounter obstacles or in this case a slit.

## Scope

This experiment intends to overview the behavior of diffraction and observe the diffraction patterns. The main goal of the experiment is to research the aspects of diffraction. System Overview

* 1. Definitions

SDE: Slit Diffraction Experiment LV: LabVIEW

# System Architecture

## Architectural Design

Develop a program explaining the diffraction using a control box that feeds a signal, a stepping motor that has two stepping. Also use of a laser as a source, photo diode and diffraction grating.

## Design Rationale

Diffraction of other waves in the electromagnetic spectrum such as x-ray diffraction were of interest. X-ray diffraction would require a high voltage difference to accelerate electrons, would give out a lot of heat. Due to the availability of the components mentioned in the architectural design, diffraction using a laser was chosen.

# Human Interface Design

## Overview of User Interface

The user should be able control certain aspects of the SDE using LV and receive feedback from the data acquisition device (NI USB-6341).