Scientific Computing Project Report

**Iterative Numerical Solutions for the Two-Dimensional Poisson Equation:**

**Gauss – Seidel and Successive Over Relaxation Methods**

**(Project: AP02-2)**

Daniel Bosquez

PSID: 1332758

May 5, 2019

MECE5397: Scientific Computing for Mechanical Engineers

Spring 2019

Dr. A. Prosperetti

Dr. A. Amritkar

**Abstract**

**Mathematical Problem Statement**

A MATLAB code was written to generate a numerical solution for the following problem:

Where the domain is a rectangle with bounds

,

,

And the following boundary conditions

, ,

,

**Discretization of 2nd Order 2D Poisson Eqn.**

Gauss – Seidel:

Approximate 2nd order terms using the Taylor Series 2nd Order Centered Difference Formula, where,

And substitute