

# **CSC411: Assignment 3**

Due on Sunday, December 3<sup>rd</sup>, 2017

Student Name: **Gokul K. Kaushik**

Student Number: **999878191**

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## 1 - 20 Newsgroup Predictions

## 2 - Training SVM with SGD

### 2.1 - SGD with Momentum

### 2.2 - Training SVM

### 2.3 - Apply 4-vs-9 Digits on MNIST

#### 2.3.1 - Training Loss

#### 2.3.2 - Test Loss

#### 2.3.3 - Classification Accuracy on the Training Set

#### 2.3.4 - Classification Accuracy on the Test Set

#### 2.3.5 - Plot $w$ as a $28 \times 28$ image

## 3 - Kernels

### 3.1 - Positive Semi definite and Quadratic Form

### 3.2 - Kernel Properties

#### 3.2.1 - Prove Property

#### 3.2.2 - Prove Property

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#### 3.2.3 - Prove Property

#### 3.2.4 - Prove Property