**List of Figures**

|  |  |  |
| --- | --- | --- |
| Figure 1.1 | Project overview for American sign language……………………………. |  |
| Figure 2.1 | A Data Glove design with Sensor………………………………………… |  |
| Figure 2.2 | A Glove device with Sensor………………………………………………... |  |
| Figure 3.1 | American Sign language Manual Alphabet……………………………….. |  |
| Figure 3.2 | American Sign language numbers…………………………………………. |  |
| Figure 3.3 | Data set images…………………………………………………………….  . |  |
| Figure 4.1 | Hand posture detection steps………………………………………………. |  |
| Figure 4.2 | HSV Colour Space………………………………………………………… |  |
| Figure 4.3 | Images of detected hand postures…………………………………………. |  |
| Figure 5.1 | Diagram of image processing pipeline……………………………………. |  |
| Figure 5.2 | Figure shows different levels of generalization of model………………… |  |
| Figure 5.3 | Relationship between the model complexity and its ultimate accuracy is the relationship between training and testing error……………………………. |  |
| Figure 6.1 | Diagram of artificial neuron………………………………………………. |  |
| Figure 6.2 | Activation Functions ………………………………………………………. |  |
| Figure 6.3 | Fully connected Feed Forward Neural Network…………………………… |  |
| Figure 6.4 | Structure of Convolutional Neural Network………………………………. |  |
| Figure 6.5 | A zero padded 4x4 matrix………………………………………………….. |  |
| Figure 6.6 | Principle of Max-pooling…………………………………………………. |  |
| Figure 6.7 | Dropout: (a)Standard fully connected network. (b) Network with some neurons deactivated. (c) Activation of neuron during training phase. (d) Activation of neuron during testing phase………………………………… |  |
| Figure 7.1 | CNN network architecture for Alphabets…………………………………. |  |
| Figure 7.2 | Epochs vs. validation accuracy for digits…………………………………. |  |
| Figure 7.3 | Epochs v's validation accuracy for alphabets ……………………………… |  |
| Figure 7.4 | Confusion matrix for 0 to 9 digits………………………………………… |  |
| Figure 7.5 | Confusion matrix for A to Z digits ……………………………………….. |  |