# SVM 和 KNN：

注意：各使用四种特征提取方法：LBP HOG GLCM Hu

验证集的混淆矩阵如下图：

其中横轴表示真实样本标签、纵轴表示样本预测标签，下、右四块浅灰色表示TP、TN、FP、FN等有关不平衡分布样本评价指标参数。















图形用户界面, 应用程序, 表格, Excel

描述已自动生成

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 'accuracyTable' | 'LBP' | 'HOG' | 'GLCM' | 'Hu' |
| 'KNN' | 0.910011248593926 | 0.929133858267717 | 0.515748031496063 | 0.622047244094488 |
| 'SVM' | 0.913948256467942 | 0.936445444319460 | 0.367266591676041 | 0.556242969628796 |

对HELLO WORLD几个字母处理后测试：  
padding 至128\*128：

应用程序, 表格, Excel

描述已自动生成

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 'accuracyTable' | 'LBP' | 'HOG' | 'GLCM' | 'Hu' |
| 'KNN' | 0.300000000000000 | 0.100000000000000 | 0.300000000000000 | 0.200000000000000 |
| 'SVM' | 0.300000000000000 | 0.600000000000000 | 0.300000000000000 | 0.200000000000000 |

识别结果：

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LBP | | | | |
| 图片序号 | 图片字母 | 图片label | KNN识别结果 | SVM识别结果 |
| 1 | D | 1 | 2 | 4 |
| 2 | E | 2 | 4 | 4 |
| 3 | H | 3 | 4 | 4 |
| 4 | L | 4 | 4 | 4 |
| 5 | L | 4 | 4 | 4 |
| 6 | L | 4 | 4 | 4 |
| 7 | O | 5 | 2 | 4 |
| 8 | O | 5 | 2 | 4 |
| 9 | R | 6 | 4 | 4 |
| 10 | W | 7 | 6 | 4 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HOG | | | | |
| 图片序号 | 图片字母 | 图片label | KNN识别结果 | SVM识别结果 |
| 1 | D | 1 | 3 | 4 |
| 2 | E | 2 | 3 | 3 |
| 3 | H | 3 | 3 | 3 |
| 4 | L | 4 | 3 | 4 |
| 5 | L | 4 | 3 | 4 |
| 6 | L | 4 | 3 | 4 |
| 7 | O | 5 | 3 | 5 |
| 8 | O | 5 | 3 | 5 |
| 9 | R | 6 | 3 | 4 |
| 10 | W | 7 | 3 | 4 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| GLCM | | | | |
| 图片序号 | 图片字母 | 图片label | KNN识别结果 | SVM识别结果 |
| 1 | D | 1 | 4 | 4 |
| 2 | E | 2 | 4 | 4 |
| 3 | H | 3 | 4 | 4 |
| 4 | L | 4 | 4 | 4 |
| 5 | L | 4 | 4 | 4 |
| 6 | L | 4 | 4 | 4 |
| 7 | O | 5 | 4 | 4 |
| 8 | O | 5 | 4 | 4 |
| 9 | R | 6 | 4 | 4 |
| 10 | W | 7 | 4 | 4 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hu | | | | |
| 图片序号 | 图片字母 | 图片label | KNN识别结果 | SVM识别结果 |
| 1 | D | 1 | 5 | 5 |
| 2 | E | 2 | 5 | 5 |
| 3 | H | 3 | 3 | 3 |
| 4 | L | 4 | 3 | 3 |
| 5 | L | 4 | 3 | 3 |
| 6 | L | 4 | 3 | 3 |
| 7 | O | 5 | 5 | 5 |
| 8 | O | 5 | 3 | 3 |
| 9 | R | 6 | 5 | 5 |
| 10 | W | 7 | 5 | 3 |

Resizing至128\*128：

截图里有图片

描述已自动生成

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 'accuracyTable' | 'LBP' | 'HOG' | 'GLCM' | 'Hu' |
| 'KNN' | 0.800000000000000 | 0.700000000000000 | 0.300000000000000 | 0.300000000000000 |
| 'SVM' | 0.400000000000000 | 0.700000000000000 | 0.400000000000000 | 0.100000000000000 |

识别结果：

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| LBP | | | | |
| 图片序号 | 图片字母 | 图片label | KNN识别结果 | SVM识别结果 |
| 1 | D | 1 | 1 | 4 |
| 2 | E | 2 | 2 | 3 |
| 3 | H | 3 | 3 | 3 |
| 4 | L | 4 | 4 | 4 |
| 5 | L | 4 | 4 | 4 |
| 6 | L | 4 | 4 | 4 |
| 7 | O | 5 | 3 | 4 |
| 8 | O | 5 | 3 | 4 |
| 9 | R | 6 | 6 | 3 |
| 10 | W | 7 | 7 | 3 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| HOG | | | | |
| 图片序号 | 图片字母 | 图片label | KNN识别结果 | SVM识别结果 |
| 1 | D | 1 | 2 | 2 |
| 2 | E | 2 | 2 | 2 |
| 3 | H | 3 | 3 | 3 |
| 4 | L | 4 | 4 | 4 |
| 5 | L | 4 | 4 | 4 |
| 6 | L | 4 | 4 | 4 |
| 7 | O | 5 | 4 | 2 |
| 8 | O | 5 | 5 | 2 |
| 9 | R | 6 | 3 | 6 |
| 10 | W | 7 | 7 | 7 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| GLCM | | | | |
| 图片序号 | 图片字母 | 图片label | KNN识别结果 | SVM识别结果 |
| 1 | D | 1 | 2 | 2 |
| 2 | E | 2 | 2 | 2 |
| 3 | H | 3 | 2 | 1 |
| 4 | L | 4 | 4 | 4 |
| 5 | L | 4 | 4 | 4 |
| 6 | L | 4 | 7 | 4 |
| 7 | O | 5 | 2 | 2 |
| 8 | O | 5 | 2 | 2 |
| 9 | R | 6 | 2 | 2 |
| 10 | W | 7 | 1 | 2 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hu | | | | |
| 图片序号 | 图片字母 | 图片label | KNN识别结果 | SVM识别结果 |
| 1 | D | 1 | 1 | 4 |
| 2 | E | 2 | 6 | 2 |
| 3 | H | 3 | 6 | 2 |
| 4 | L | 4 | 4 | 2 |
| 5 | L | 4 | 4 | 2 |
| 6 | L | 4 | 1 | 2 |
| 7 | O | 5 | 2 | 1 |
| 8 | O | 5 | 6 | 6 |
| 9 | R | 6 | 4 | 1 |
| 10 | W | 7 | 4 | 4 |

# SOM：

自组织映射网络大小：10\*10

神经元节点总数100

迭代次数：1000

初始化学习率：**0.5**

训练时候绘制的标签的分布：



验证集的混淆矩阵：



验证集结果：accuracy = 0.3633

测试集padding后（128\*128）：accuracy = 0.3000

|  |  |  |  |
| --- | --- | --- | --- |
| 图片序号 | 图片字母 | 图片label | SOM识别结果 |
| 1 | H | 3 | 4 |
| 2 | E | 2 | 4 |
| 3 | L | 4 | 4 |
| 4 | L | 4 | 4 |
| 5 | O | 5 | 4 |
| 6 | W | 7 | 4 |
| 7 | O | 5 | 4 |
| 8 | R | 6 | 4 |
| 9 | L | 4 | 4 |
| 10 | D | 1 | 4 |

测试集resizing后（128\*128）：accuracy = 0.1000

|  |  |  |  |
| --- | --- | --- | --- |
| 图片序号 | 图片字母 | 图片label | SOM识别结果 |
| 1 | H | 3 | 6 |
| 2 | E | 2 | 7 |
| 3 | L | 4 | 5 |
| 4 | L | 4 | 4 |
| 5 | O | 5 | 7 |
| 6 | W | 7 | 4 |
| 7 | O | 5 | 7 |
| 8 | R | 6 | 4 |
| 9 | L | 4 | 7 |
| 10 | D | 1 | 4 |

自组织映射网络大小：10\*10

神经元节点总数100

迭代次数：1000

初始化学习率：**0.2**

训练时候绘制的标签的分布：



验证集混淆矩阵：



验证集结果：accuracy = 0.3431

测试集padding后（128\*128）：accuracy = 0.3000

|  |  |  |  |
| --- | --- | --- | --- |
| 图片序号 | 图片字母 | 图片label | SOM识别结果 |
| 1 | H | 3 | 4 |
| 2 | E | 2 | 4 |
| 3 | L | 4 | 4 |
| 4 | L | 4 | 4 |
| 5 | O | 5 | 4 |
| 6 | W | 7 | 4 |
| 7 | O | 5 | 4 |
| 8 | R | 6 | 4 |
| 9 | L | 4 | 4 |
| 10 | D | 1 | 4 |

测试集resizing后（128\*128）：accuracy = 0.0000

|  |  |  |  |
| --- | --- | --- | --- |
| 图片序号 | 图片字母 | 图片label | SOM识别结果 |
| 1 | H | 3 | 6 |
| 2 | E | 2 | 4 |
| 3 | L | 4 | 5 |
| 4 | L | 4 | 3 |
| 5 | O | 5 | 7 |
| 6 | W | 7 | 4 |
| 7 | O | 5 | 4 |
| 8 | R | 6 | 1 |
| 9 | L | 4 | 7 |
| 10 | D | 1 | 5 |

自组织映射网络大小：10\*10

神经元节点总数100

迭代次数：1000

初始化学习率：**0.1**

训练时候绘制的标签的分布：



验证集混淆矩阵：  


验证集结果：accuracy = 0.3318

测试集padding后（128\*128）：accuracy = 0.3000

|  |  |  |  |
| --- | --- | --- | --- |
| 图片序号 | 图片字母 | 图片label | SOM识别结果 |
| 1 | H | 3 | 4 |
| 2 | E | 2 | 4 |
| 3 | L | 4 | 4 |
| 4 | L | 4 | 4 |
| 5 | O | 5 | 4 |
| 6 | W | 7 | 4 |
| 7 | O | 5 | 4 |
| 8 | R | 6 | 4 |
| 9 | L | 4 | 4 |
| 10 | D | 1 | 4 |

测试集resizing后（128\*128）：accuracy = 0.1000

|  |  |  |  |
| --- | --- | --- | --- |
| 图片序号 | 图片字母 | 图片label | SOM识别结果 |
| 1 | H | 3 | 6 |
| 2 | E | 2 | 4 |
| 3 | L | 4 | 5 |
| 4 | L | 4 | 4 |
| 5 | O | 5 | 4 |
| 6 | W | 7 | 4 |
| 7 | O | 5 | 4 |
| 8 | R | 6 | 4 |
| 9 | L | 4 | 7 |
| 10 | D | 1 | 4 |