Table S1. Classification performance for each activity (A1 to A9) using 1-NN models at the group level.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Sensitivity** | | | **Specificity** | | | **Precision** | | | **Accuracy** | | | **F-Score** | | |
| **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** |
| **A1** | 0.95 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.96 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.96 | 0.99 | 0.99 |
| **A2** | 0.97 | 0.98 | 0.99 | 0.99 | 0.99 | 0.99 | 0.96 | 0.98 | 0.99 | 0.99 | 0.99 | 0.99 | 0.96 | 0.98 | 0.99 |
| **A3** | 0.97 | 0.98 | 0.99 | 0.99 | 0.99 | 0.99 | 0.97 | 0.98 | 0.99 | 0.99 | 0.99 | 0.99 | 0.97 | 0.98 | 0.99 |
| **A4** | 0.97 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.97 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.97 | 0.99 | 0.99 |
| **A5** | 0.97 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.97 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.97 | 0.99 | 0.99 |
| **A6** | 0.97 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.97 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.97 | 0.99 | 0.99 |
| **A7** | 0.98 | 0.96 | 0.98 | 0.99 | 0.99 | 0.99 | 0.98 | 0.97 | 0.99 | 0.99 | 0.99 | 0.99 | 0.98 | 0.97 | 0.98 |
| **A8** | 0.98 | 0.97 | 0.98 | 0.99 | 0.99 | 0.99 | 0.98 | 0.97 | 0.98 | 0.99 | 0.99 | 0.99 | 0.98 | 0.97 | 0.98 |
| **A9** | 0.98 | 0.98 | 0.99 | 0.99 | 0.99 | 0.99 | 0.97 | 0.98 | 0.99 | 0.99 | 0.99 | 0.99 | 0.98 | 0.98 | 0.99 |
| **Mean** | **0.97** | **0.98** | **0.98** | **0.99** | **0.99** | **0.99** | **0.97** | **0.98** | **0.98** | **0.99** | **0.99** | **0.99** | **0.97** | **0.98** | **0.98** |

Table S2. Classification performance for each activity (A1 to A9) using 10-NN models at the group level.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Sensitivity** | | | **Specificity** | | | **Precision** | | | **Accuracy** | | | **F-Score** | | |
| **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** |
| **A1** | 0.93 | 0.97 | 0.98 | 0.99 | 0.99 | 0.99 | 0.95 | 0.96 | 0.98 | 0.98 | 0.99 | 0.99 | 0.94 | 0.96 | 0.98 |
| **A2** | 0.95 | 0.95 | 0.98 | 0.99 | 0.99 | 0.99 | 0.95 | 0.95 | 0.98 | 0.99 | 0.99 | 0.99 | 0.95 | 0.95 | 0.98 |
| **A3** | 0.95 | 0.94 | 0.98 | 0.99 | 0.99 | 0.99 | 0.95 | 0.95 | 0.98 | 0.99 | 0.99 | 0.99 | 0.95 | 0.95 | 0.98 |
| **A4** | 0.96 | 0.96 | 0.98 | 0.99 | 0.99 | 0.99 | 0.95 | 0.96 | 0.98 | 0.99 | 0.99 | 0.99 | 0.95 | 0.96 | 0.98 |
| **A5** | 0.95 | 0.98 | 0.99 | 0.99 | 0.99 | 0.99 | 0.95 | 0.98 | 0.99 | 0.98 | 0.99 | 0.99 | 0.95 | 0.98 | 0.99 |
| **A6** | 0.97 | 0.97 | 0.98 | 0.99 | 0.99 | 0.99 | 0.96 | 0.97 | 0.98 | 0.99 | 0.99 | 0.99 | 0.96 | 0.97 | 0.98 |
| **A7** | 0.96 | 0.92 | 0.96 | 0.99 | 0.99 | 0.99 | 0.97 | 0.93 | 0.97 | 0.99 | 0.98 | 0.99 | 0.96 | 0.93 | 0.97 |
| **A8** | 0.97 | 0.93 | 0.97 | 0.99 | 0.98 | 0.99 | 0.97 | 0.93 | 0.97 | 0.99 | 0.98 | 0.99 | 0.97 | 0.93 | 0.97 |
| **A9** | 0.97 | 0.96 | 0.98 | 0.99 | 0.99 | 0.99 | 0.96 | 0.96 | 0.98 | 0.99 | 0.99 | 0.99 | 0.97 | 0.96 | 0.98 |
| **Mean** | **0.95** | **0.95** | **0.97** | **0.99** | **0.99** | **0.99** | **0.96** | **0.95** | **0.97** | **0.98** | **0.98** | **0.99** | **0.95** | **0.95** | **0.97** |

Table S3. Classification performance for each activity (A1 to A9) using SVM models at the group level.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Sensitivity** | | | **Specificity** | | | **Precision** | | | **Accuracy** | | | **F-Score** | | |
| **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** | **SS** | **SUS** | **CSTS** |
| **A1** | 0.95 | 0.29 | 0.41 | 0.99 | 0.91 | 0.94 | 0.96 | 0.27 | 0.45 | 0.99 | 0.86 | 0.89 | 0.96 | 0.28 | 0.43 |
| **A2** | 0.97 | 0.23 | 0.36 | 0.99 | 0.96 | 0.94 | 0.96 | 0.41 | 0.41 | 0.99 | 0.89 | 0.88 | 0.96 | 0.29 | 0.38 |
| **A3** | 0.97 | 0.02 | 0.3 | 0.99 | 0.98 | 0.96 | 0.98 | 0.13 | 0.49 | 0.99 | 0.89 | 0.9 | 0.97 | 0.03 | 0.37 |
| **A4** | 0.97 | 0.23 | 0.54 | 0.99 | 0.89 | 0.95 | 0.97 | 0.21 | 0.57 | 0.99 | 0.82 | 0.9 | 0.97 | 0.22 | 0.56 |
| **A5** | 0.97 | 0.51 | 0.56 | 0.99 | 0.8 | 0.88 | 0.97 | 0.3 | 0.44 | 0.99 | 0.76 | 0.84 | 0.97 | 0.38 | 0.49 |
| **A6** | 0.97 | 0.34 | 0.5 | 0.99 | 0.91 | 0.93 | 0.97 | 0.34 | 0.46 | 0.99 | 0.85 | 0.88 | 0.97 | 0.34 | 0.48 |
| **A7** | 0.98 | 0.23 | 0.37 | 0.99 | 0.95 | 0.94 | 0.98 | 0.39 | 0.46 | 0.99 | 0.86 | 0.87 | 0.98 | 0.29 | 0.41 |
| **A8** | 0.98 | 0.35 | 0.41 | 0.99 | 0.8 | 0.84 | 0.98 | 0.23 | 0.3 | 0.99 | 0.74 | 0.78 | 0.98 | 0.28 | 0.35 |
| **A9** | 0.98 | 0.26 | 0.43 | 0.99 | 0.93 | 0.95 | 0.97 | 0.33 | 0.51 | 0.99 | 0.86 | 0.89 | 0.98 | 0.29 | 0.47 |
| **Mean** | **0.97** | **0.27** | **0.43** | **0.99** | **0.90** | **0.92** | **0.97** | **0.29** | **0.45** | **0.99** | **0.83** | **0.87** | **0.97** | **0.26** | **0.43** |

Actual Activities

Predicted Activities

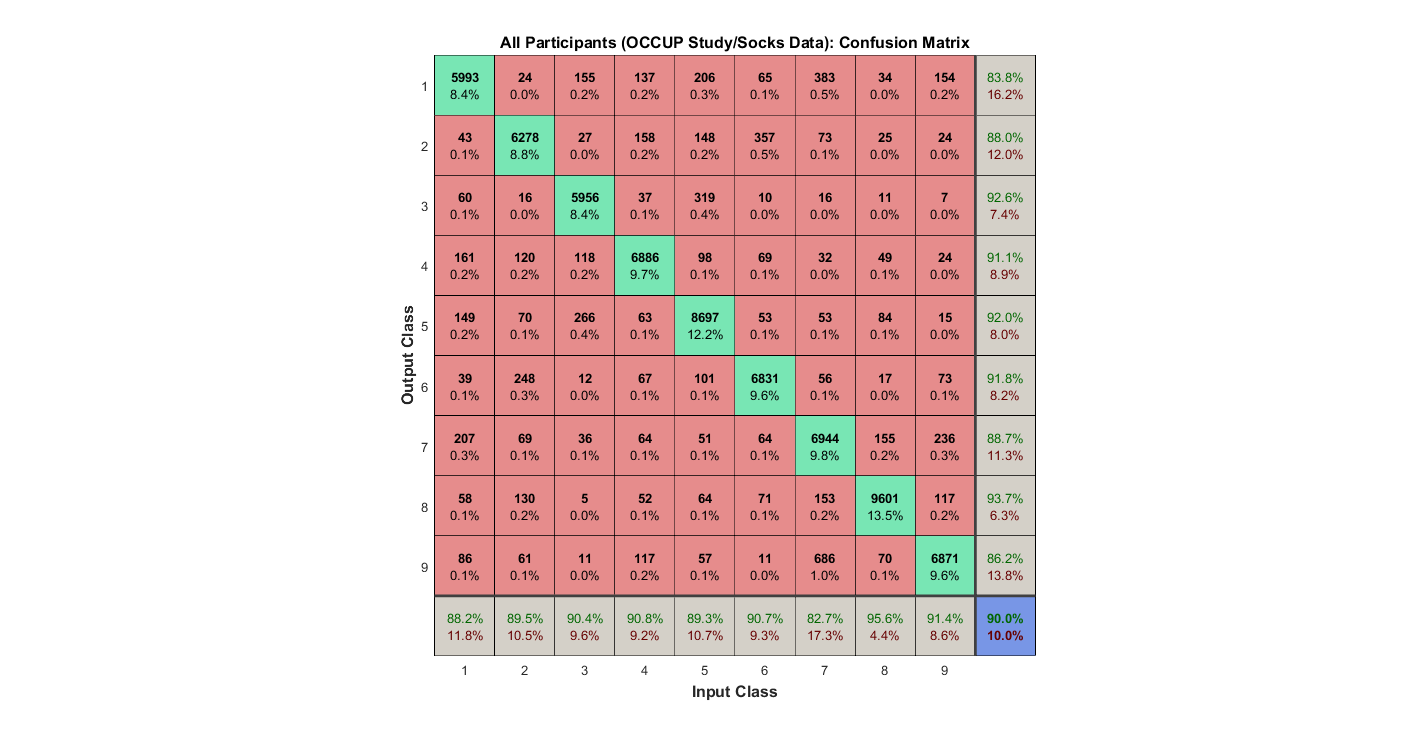
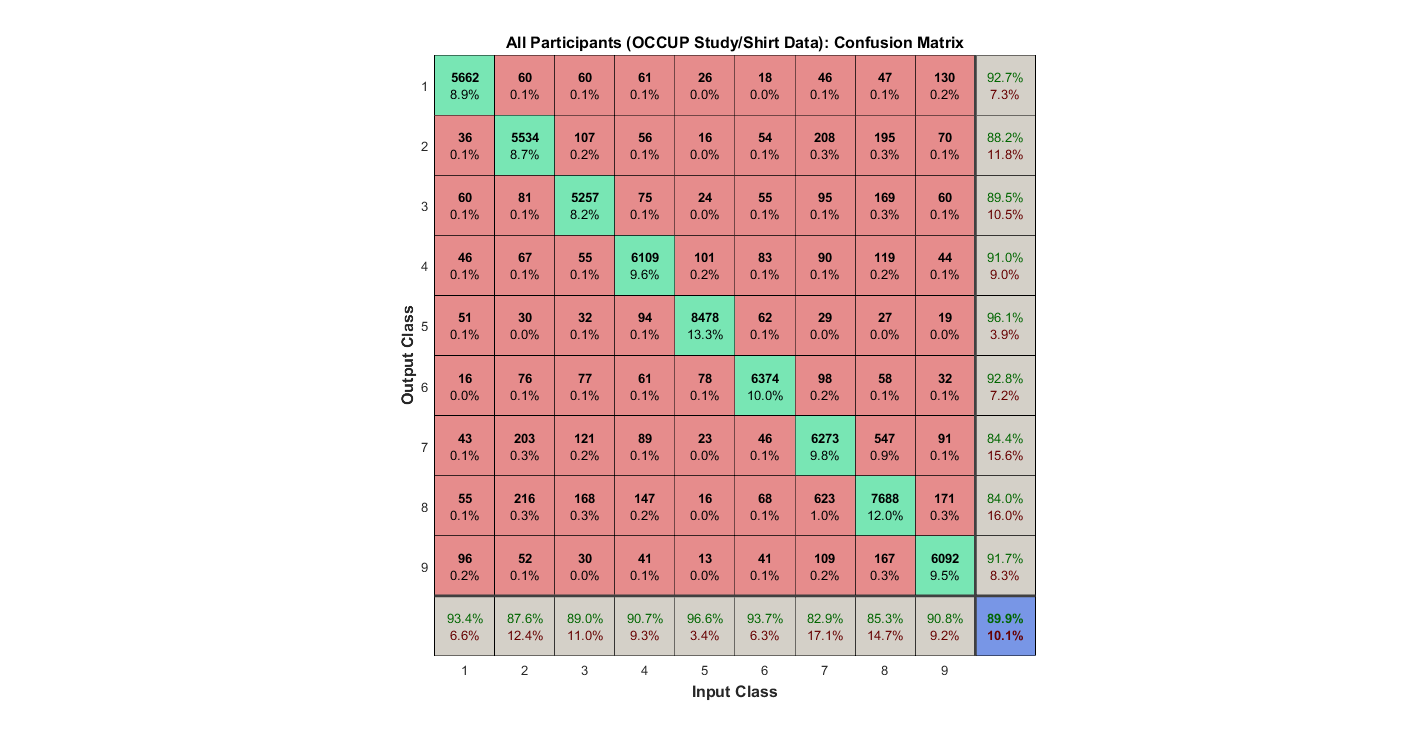


Figure S1. Confusion matrix using ANN-based classification with SS data at the group level. Cells on the main diagonal (green color) and off-diagonal (red color) indicate number and percentage of correct and incorrect classifications, respectively, of each activity. Cells in the right-hand column and lowest row (gray color) provide summations across the nine simulated activities, and give the percentages of both correct (green font) and incorrect (red font) classifications. The cell at the bottom-right corner (blue color) provides these same percentages at a global level (i.e., across all activities)



Actual Activities

Predicted Activities

Figure S2. Confusion matrix using ANN-based classification with SUS data at the group level. Cells on the main diagonal (green color) and off-diagonal (red color) indicate number and percentage of correct and incorrect classifications, respectively, of each activity. Cells in the right-hand column and lowest row (gray color) provide summations across the nine simulated activities, and give the percentages of both correct (green font) and incorrect (red font) classifications. The cell at the bottom-right corner (blue color) provides these same percentages at a global level (i.e., across all activities)



Figure S3. Confusion matrix using 1-NN-based classification with SS data at the group level. Cells on the main diagonal (green color) and off-diagonal (red color) indicate number and percentage of correct and incorrect classifications, respectively, of each activity. Cells in the right-hand column and lowest row (gray color) provide summations across the nine simulated activities, and give the percentages of both correct (green font) and incorrect (red font) classifications. The cell at the bottom-right corner (blue color) provides these same percentages at a global level (i.e., across all activities)

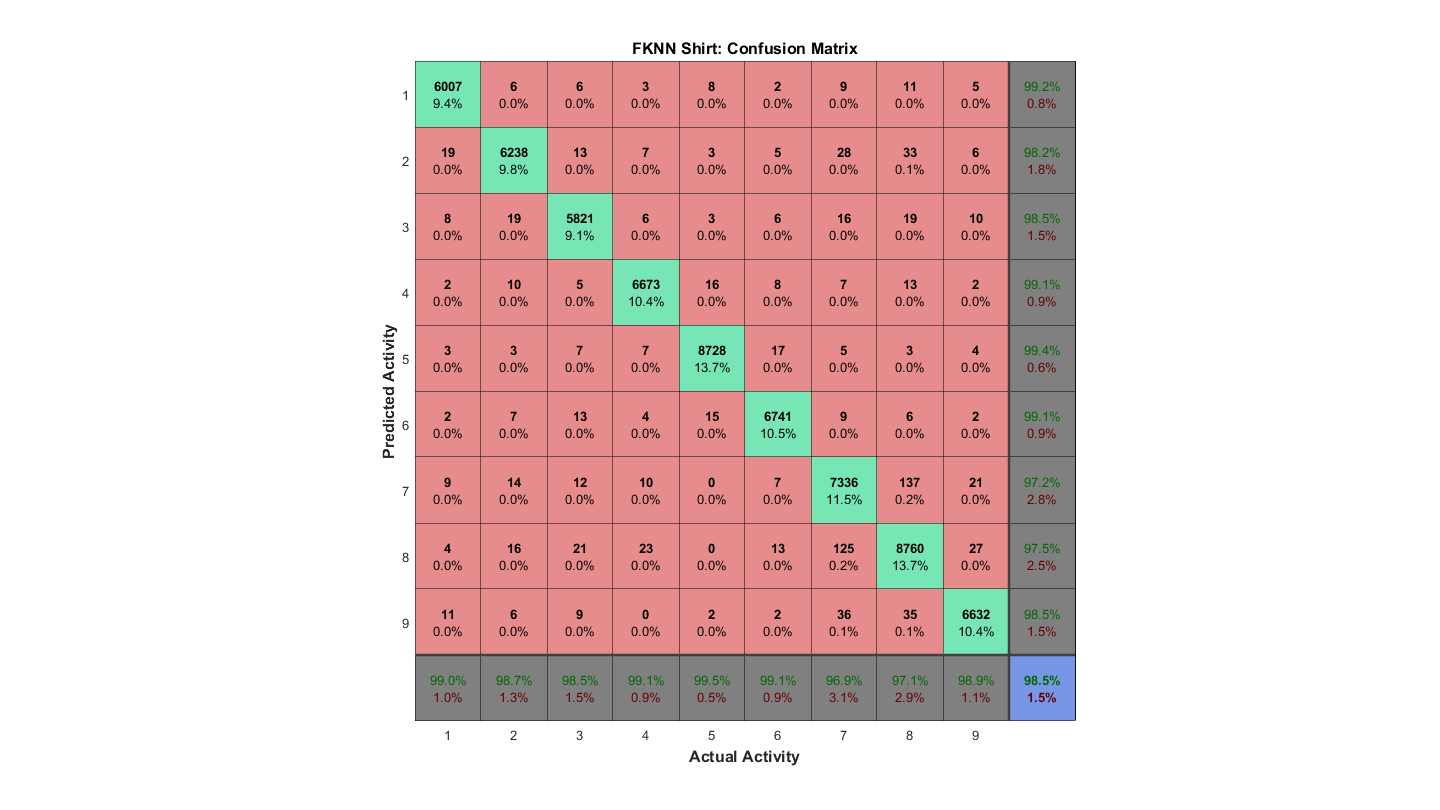


Figure S4. Confusion matrix using 1-NN-based classification with SUS data at the group level. Cells on the main diagonal (green color) and off-diagonal (red color) indicate number and percentage of correct and incorrect classifications, respectively, of each activity. Cells in the right-hand column and lowest row (gray color) provide summations across the nine simulated activities, and give the percentages of both correct (green font) and incorrect (red font) classifications. The cell at the bottom-right corner (blue color) provides these same percentages at a global level (i.e., across all activities)

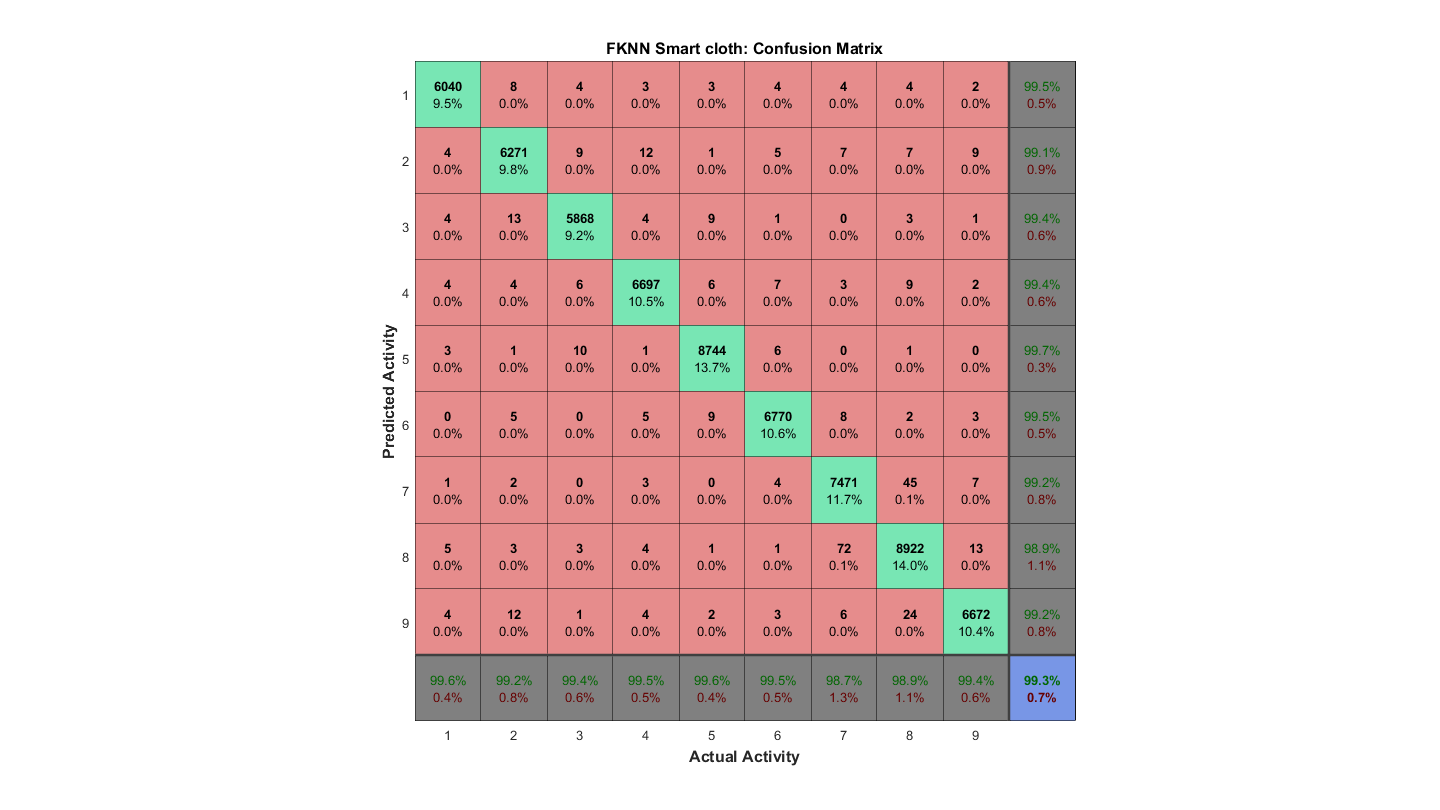


Figure S5. Confusion matrix using 1-NN-based classification with CSTS data at the group level. Cells on the main diagonal (green color) and off-diagonal (red color) indicate number and percentage of correct and incorrect classifications, respectively, of each activity. Cells in the right-hand column and lowest row (gray color) provide summations across the nine simulated activities, and give the percentages of both correct (green font) and incorrect (red font) classifications. The cell at the bottom-right corner (blue color) provides these same percentages at a global level (i.e., across all activities)

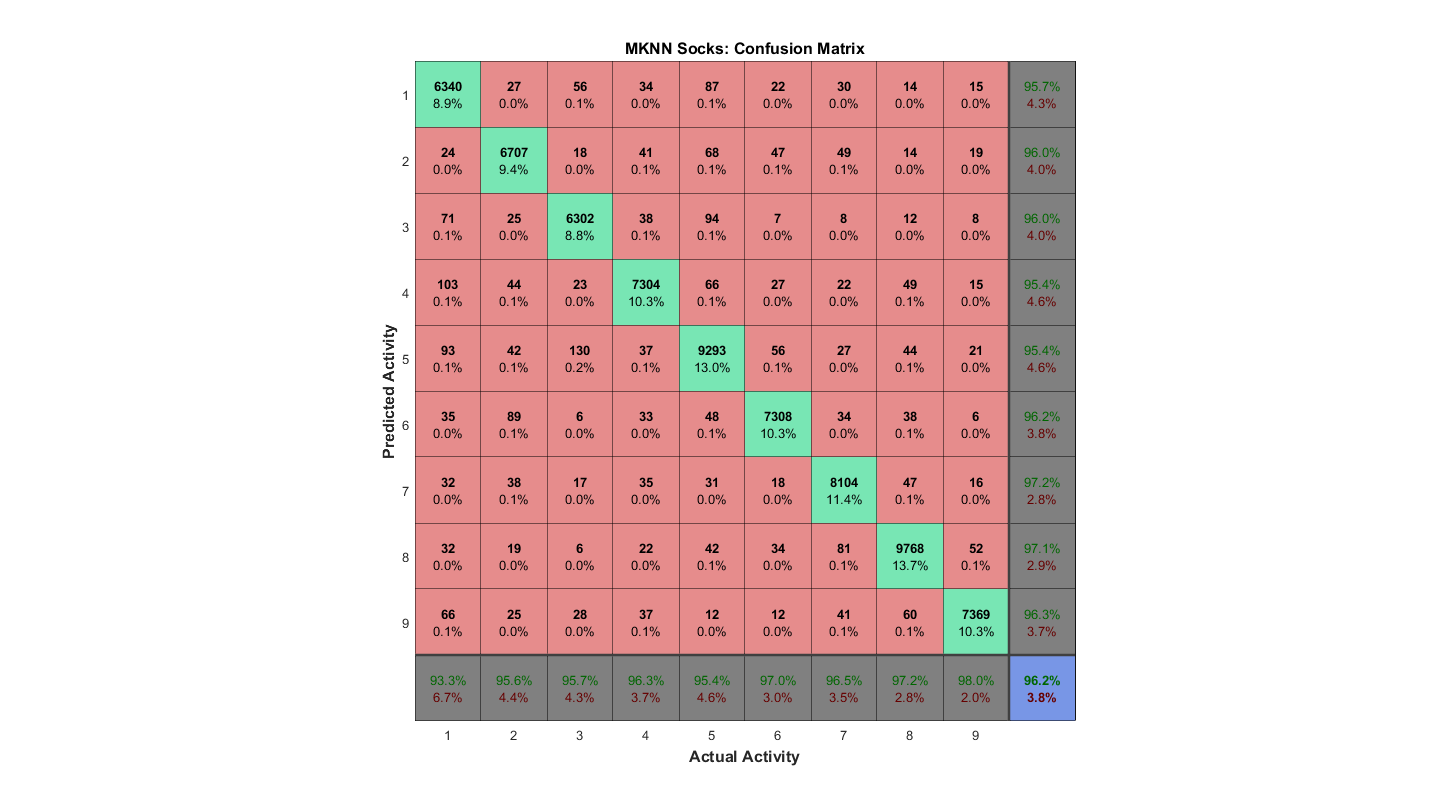


Figure S6. Confusion matrix using 10-NN-based classification with SS data at the group level. Cells on the main diagonal (green color) and off-diagonal (red color) indicate number and percentage of correct and incorrect classifications, respectively, of each activity. Cells in the right-hand column and lowest row (gray color) provide summations across the nine simulated activities, and give the percentages of both correct (green font) and incorrect (red font) classifications. The cell at the bottom-right corner (blue color) provides these same percentages at a global level (i.e., across all activities)



Figure S7. Confusion matrix using 10-NN-based classification with SUS data at the group level. Cells on the main diagonal (green color) and off-diagonal (red color) indicate number and percentage of correct and incorrect classifications, respectively, of each activity. Cells in the right-hand column and lowest row (gray color) provide summations across the nine simulated activities, and give the percentages of both correct (green font) and incorrect (red font) classifications. The cell at the bottom-right corner (blue color) provides these same percentages at a global level (i.e., across all activities)

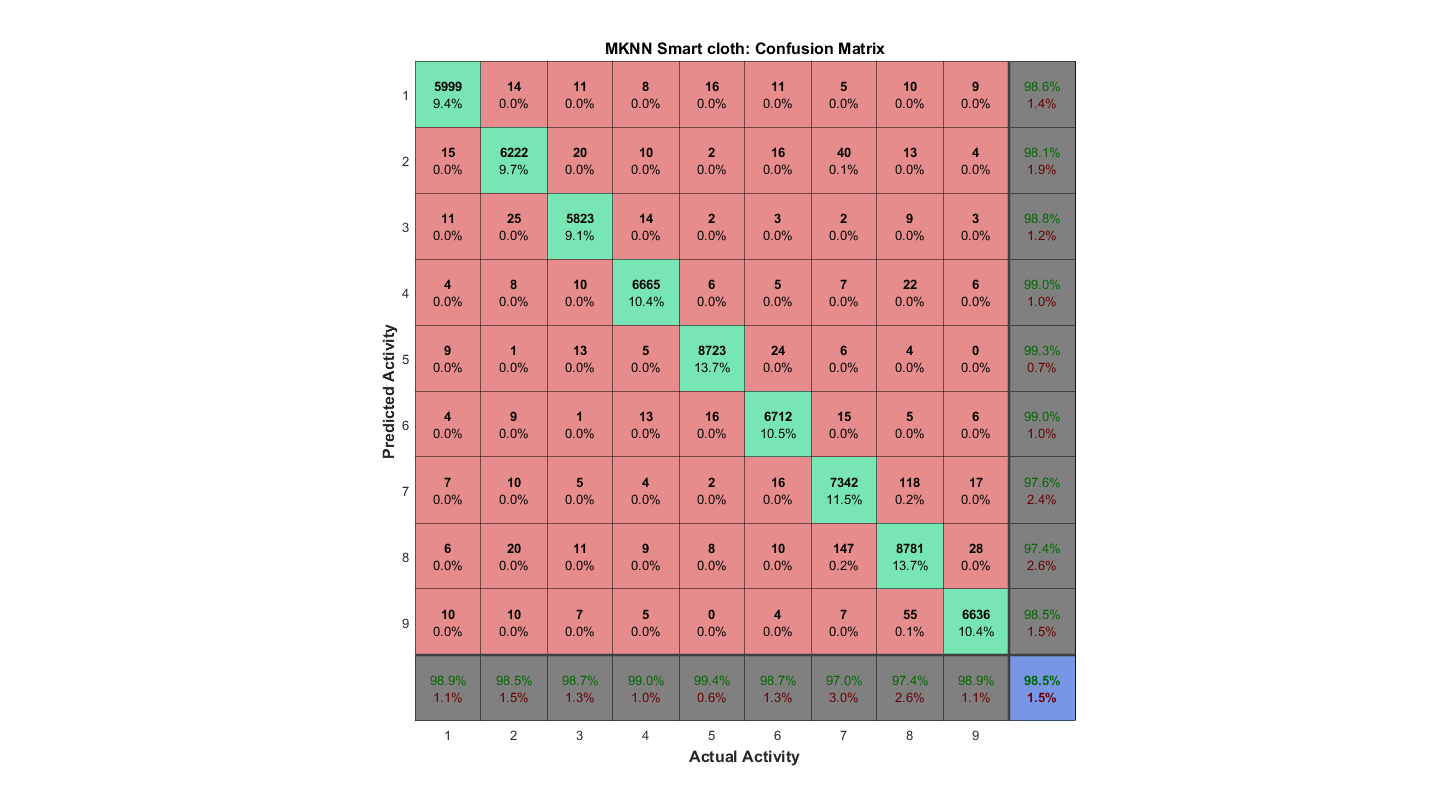


Figure S8. Confusion matrix using 10-NN-based classification with CSTS data at the group level. Cells on the main diagonal (green color) and off-diagonal (red color) indicate number and percentage of correct and incorrect classifications, respectively, of each activity. Cells in the right-hand column and lowest row (gray color) provide summations across the nine simulated activities, and give the percentages of both correct (green font) and incorrect (red font) classifications. The cell at the bottom-right corner (blue color) provides these same percentages at a global level (i.e., across all activities)



Figure S9. Confusion matrix using SVM-based classification with SS data at the group level. Cells on the main diagonal (green color) and off-diagonal (red color) indicate number and percentage of correct and incorrect classifications, respectively, of each activity. Cells in the right-hand column and lowest row (gray color) provide summations across the nine simulated activities, and give the percentages of both correct (green font) and incorrect (red font) classifications. The cell at the bottom-right corner (blue color) provides these same percentages at a global level (i.e., across all activities)

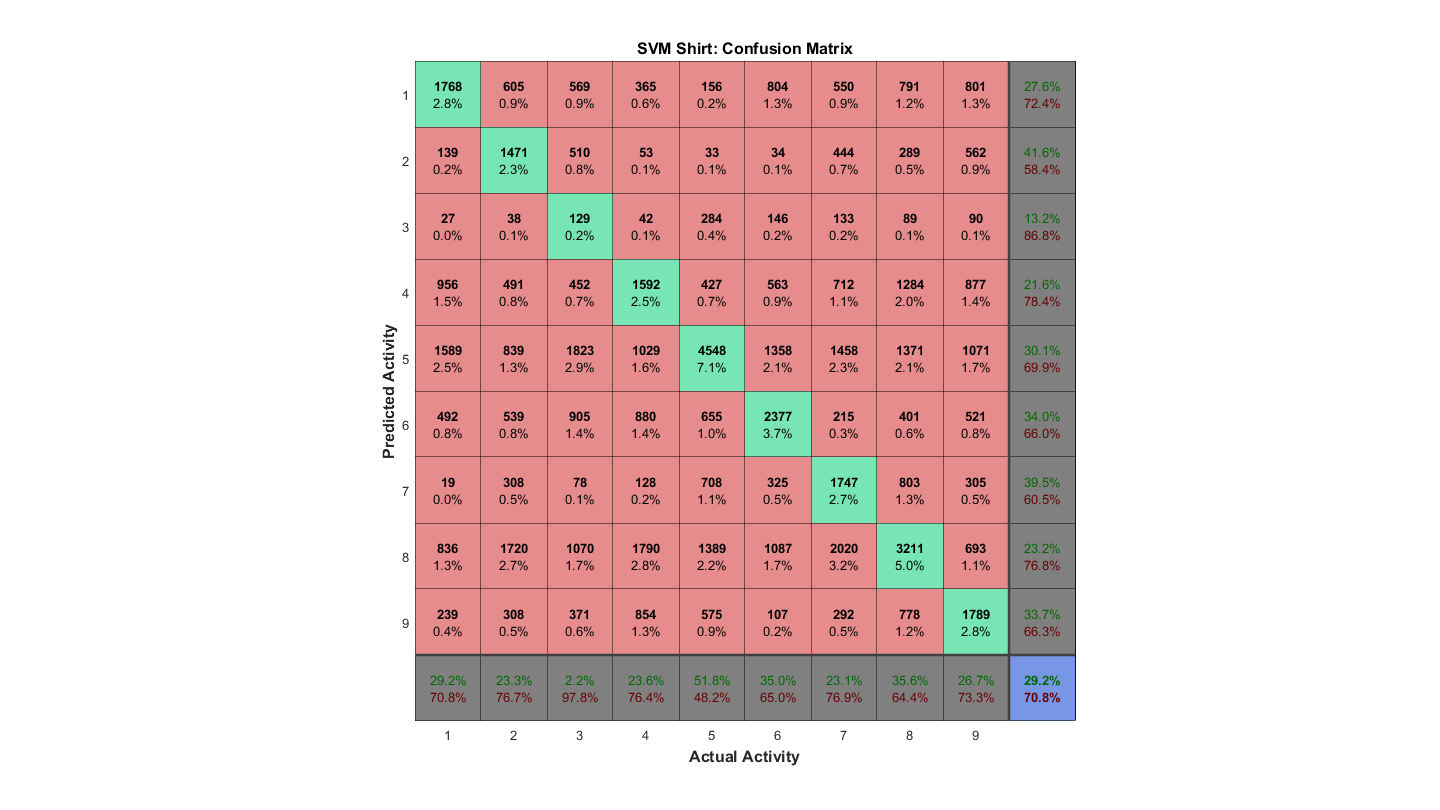


Figure S10. Confusion matrix using SVM-based classification with SUS data at the group level. Cells on the main diagonal (green color) and off-diagonal (red color) indicate number and percentage of correct and incorrect classifications, respectively, of each activity. Cells in the right-hand column and lowest row (gray color) provide summations across the nine simulated activities, and give the percentages of both correct (green font) and incorrect (red font) classifications. The cell at the bottom-right corner (blue color) provides these same percentages at a global level (i.e., across all activities)



Figure S11. Confusion matrix using SVM-based classification with CSTS data at the group level. Cells on the main diagonal (green color) and off-diagonal (red color) indicate number and percentage of correct and incorrect classifications, respectively, of each activity. Cells in the right-hand column and lowest row (gray color) provide summations across the nine simulated activities, and give the percentages of both correct (green font) and incorrect (red font) classifications. The cell at the bottom-right corner (blue color) provides these same percentages at a global level (i.e., across all activities)

Table S4. Most frequently confused pairs of activity using 1-NN-based classification at the group level, with with different data inputs. Confused pairs of activities are indicated, along with the percentage of incorrect instances that occurred for each pair.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SS** | **SUS** | **CSTS** |
| **1st** | A2, A6  0.1% | A7, A8  0.2% | A7, A8  0.1% |
| **2nd** | A1, A5  0.1% | A8, A9  0.1% | A8, A9  0.0% |
| **3rd** | A3, A5  0.1% | A7, A9  0.1% | A2, A9  0.0% |

Table S5. Most frequently confused pairs of activity using 10-NN-based classification at the group level, with with different data inputs. Confused pairs of activities are indicated, along with the percentage of incorrect instances that occurred for each pair.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SS** | **SUS** | **CSTS** |
| **1st** | A3, A5  0.2% | A7, A8  0.4% | A7, A8  0.2% |
| **2nd** | A1, A5  0.1% | A2, A7  0.1% | A8, A9  0.1% |
| **3rd** | A7, A8  0.1% | A3, A8  0.1% | A2, A7  0.1% |

Table S6. Most frequently confused pairs of activity using SVM-based classification at the group level, with with different data inputs. Confused pairs of activities are indicated, along with the percentage of incorrect instances that occurred for each pair.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SS** | **SUS** | **CSTS** |
| **1st** | A2, A6  0.1% | A7, A8  3.2% | A7, A8  2.8% |
| **2nd** | A3, A5  0.1% | A4, A8  2.8% | A6, A8  2.3%  % |
| **3rd** | A1, A4  0.1% | A5, A8  2.2% | A2, A8  2.2 |