EE650 Assignment: Paper 1
StressID: a Multimodal Dataset for Stress Identification

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22/10/2024

Code Implementation

The already available code in one of the GitHub repositories does not run as it is outdated (uses a lot of deprecated methods). It throws a number of errors even after configuring multiple versions of the libraries.

Hence, the code had to be self-written to perform a similar function.

Dataset

The features of audio, video, and physiological signals were available in the form of CSV files, which contained vital measures/extracts and some hand-crafted features from audio and video signals.

The big missing chunk of the dataset is the labels/ground truths of the stress rating provided by the participants themselves during the creation of the dataset. The 'self-assessment.csv' and 'labels.csv' files are unavailable. Hence, a similar dataset (with similar format, unique values, and distribution) was manually created, and the code was implemented on it, which affected the accuracy.

Results

All the results are also displayed in the accompanying `.ipynb` notebooks.

Out[7]:

classifier	f1-score	accuracy	time
KNeighborsClassifier	0.597635	0.624336	7.037865
MLPClassifier	0.644288	0.610884	8.607246
RandomForestClassifier	0.655604	0.589220	6.661447
SVC	0.679749	0.619802	6.039070

(a) Result 1

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	Training Time (s)	Accuracy	F1 Score
RandomForestClassifier	0.433036	0.684211	0.812500
KNeighborsClassifier	0.003650	0.605263	0.741379
SVC	0.019562	0.684211	0.812500
MLPClassifier	0.046906	0.526316	0.632653

(b) corresponding

Out[14]:

classifier	f1-score	accuracy	time
KNeighborsClassifier	0.701995	0.701887	1.048699
MLPClassifier_2_128	0.675400	0.676371	2.443880
MLPClassifier_2_256	0.694357	0.696828	3.100957
MLPClassifier_2_64	0.683503	0.683776	2.228803
MLPClassifier_3_128	0.654709	0.654876	2.095852
MLPClassifier_3_256	0.697854	0.698221	2.827694
MLPClassifier_3_64	0.670366	0.671002	1.906241
MLPClassifier_4_128	0.674840	0.674602	1.954160
MLPClassifier_4_256	0.699030	0.699456	3.315197
MLPClassifier_4_64	0.693373	0.694269	1.760813
SVC	0.691404	0.692720	1.117100

(c) Result 2

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	Training Time (s)	Accuracy	F1 Score
KNeighborsClassifier	0.010501	0.649351	0.635727
SVC	0.015292	0.701299	0.578170
MLPClassifier (Hidden Layers: (64, 64))	2.234086	0.636364	0.636364
MLPClassifier (Hidden Layers: (128, 128))	1.741586	0.571429	0.554778
MLPClassifier (Hidden Layers: (256, 256))	2.024849	0.610390	0.605077
MLPClassifier (Hidden Layers: (64, 64, 64))	1.128644	0.571429	0.562270
MLPClassifier (Hidden Layers: (128, 128, 128))	1.551480	0.545455	0.548166
MLPClassifier (Hidden Layers: (256, 256, 256))	1.947421	0.558442	0.558442
MLPClassifier (Hidden Layers: (64, 64, 64, 64))	1.015595	0.558442	0.563475
MLPClassifier (Hidden Layers: (128, 128, 128, 1...	1.275406	0.506494	0.499764
MLPClassifier (Hidden Layers: (256, 256, 256, 2...	2.101170	0.571429	0.578426

(d) corresponding

Out[13]:

classifier	f1-score	accuracy	time
KNeighborsClassifier	0.510267	0.504914	3.591494
MLPClassifier	0.537366	0.526720	4.527540
RandomForestClassifier	0.559803	0.568780	3.967809
SVC	0.588597	0.585403	3.713235

(e) Result 3

	Training Time (s)	Accuracy	F1 Score
RandomForestClassifier	0.625792	0.438710	0.400000
KNeighborsClassifier	0.003141	0.438710	0.423841
SVC	0.070030	0.509677	0.000000
MLPClassifier	0.023736	0.503226	0.000000

(f) corresponding