Sample Output and Current Performance Report

1. Sample Output

The output of the emotion detection will be classified into 6 class (happy, sad, surprised, disgusting, angry and sad). The data will be processed using NN / KNN to determine which class data belongs to. Each of class will give the confidence value within range 0 to 1 which means 0% to 100% in percent scale (multiplied by 100).

- Happy Detection Ranking.

label	prediction(label)	confidence(happy)	confidence(sad)	confidence(surprised)	confidence(disgusting)	confidence(angry)	confidence(fear)
happy	happy	0.978	0.000	0.005	0.013	0.000	0.003
happy	happy	0.972	0.000	0.002	0.017	0.000	0.008
happy	happy	0.946	0.000	0.002	0.040	0.000	0.011
happy	happy	0.936	0.000	0.001	0.044	0.000	0.019
happy	happy	0.998	0.000	0.001	0.000	0.001	0.000
happy	happy	0.996	0.000	0.001	0.001	0.000	0.002
happy	happy	0.989	0.000	0.001	0.007	0.000	0.003
happy	happy	0.994	0.000	0.001	0.000	0.005	0.000
happy	happy	0.979	0.000	0.001	0.013	0.000	0.007
happy	happy	0.934	0.000	0.001	0.049	0.000	0.015

In the first row of happy data class, happy detected as happy with the value of confidence as mentioned below:

- Ranked Data
  1. Happy : 0.97 (Rank 1)
  2. Sad : 0.00 (Rank 5)
  3. Surprised : 0.005 (Rank 3)
  4. Disgusting : 0.013 (Rank 2)
  5. Angry : 0.00 (Rank 6)
  6. Fear : 0.003 (Rank 4)

- Sad Detection Ranking.

label	prediction(label)	confidence(happy)	confidence(sad)	confidence(surprised)	confidence(disgusting)	confidence(angry)	confidence(fear)
sad	sad	0.001	0.971	0.000	0.000	0.022	0.006
sad	sad	0.001	0.978	0.000	0.000	0.014	0.006
sad	sad	0.002	0.970	0.000	0.000	0.022	0.007
sad	sad	0.001	0.976	0.000	0.000	0.017	0.005
sad	sad	0.001	0.968	0.000	0.000	0.024	0.007
sad	sad	0.001	0.972	0.000	0.000	0.019	0.008
sad	sad	0.001	0.979	0.000	0.000	0.013	0.007
sad	sad	0.002	0.970	0.000	0.000	0.023	0.006
sad	sad	0.001	0.969	0.000	0.000	0.024	0.006
sad	sad	0.002	0.970	0.000	0.000	0.023	0.005

In the first row of sad data class, sad detected as sad with the value of confidence as mentioned below:

- Ranked Data
  1. Happy : 0.001 (Rank 4)
  2. Sad : 0.971 (Rank 1)
  3. Surprised : 0.00 (Rank 5)
  4. Disgusting : 0.00 (Rank 6)
  5. Angry : 0.022 (Rank 2)
  6. Fear : 0.006 (Rank 3)

- Surprised Detection Ranking.

label	prediction(label)	confidence(happy)	confidence(sad)	confidence(surprised)	confidence(disgusting)	confidence(angry)	confidence(fear)
surprised	surprised	0.005	0.000	0.949	0.027	0.000	0.020
surprised	surprised	0.005	0.000	0.940	0.027	0.000	0.029
surprised	surprised	0.005	0.000	0.970	0.011	0.000	0.013
surprised	surprised	0.005	0.000	0.963	0.018	0.000	0.014
surprised	surprised	0.006	0.000	0.966	0.013	0.000	0.015
surprised	surprised	0.006	0.000	0.964	0.014	0.000	0.016
surprised	surprised	0.006	0.000	0.971	0.011	0.000	0.012
surprised	surprised	0.007	0.000	0.967	0.013	0.000	0.013
surprised	surprised	0.005	0.000	0.963	0.013	0.000	0.018
surprised	surprised	0.004	0.000	0.966	0.016	0.000	0.014

In the first row of surprised data class, surprised detected as surprised with the value of confidence as mentioned below:

- Ranked Data
  1. Happy : 0.005 (Rank 4)
  2. Sad : 0.00 (Rank 5)
  3. Surprised : 0.949 (Rank 1)
  4. Disgusting : 0.027 (Rank 2)
  5. Angry : 0.00 (Rank 6)
  6. Fear : 0.02 (Rank 3)

- Disgusting Detection Ranking.

label	prediction(label)	confidence(happy)	confidence(sad)	confidence(surprised)	confidence(disgusting)	confidence(angry)	confidence(fear)
disgusting	disgusting	0.007	0.000	0.011	0.950	0.031	0.000
disgusting	disgusting	0.011	0.002	0.002	0.931	0.055	0.000
disgusting	disgusting	0.007	0.001	0.003	0.910	0.079	0.000
disgusting	disgusting	0.007	0.000	0.007	0.974	0.011	0.000
disgusting	disgusting	0.007	0.001	0.008	0.957	0.028	0.000
disgusting	disgusting	0.006	0.000	0.008	0.981	0.004	0.000
disgusting	disgusting	0.006	0.000	0.020	0.969	0.005	0.000
disgusting	disgusting	0.009	0.001	0.004	0.919	0.067	0.000
disgusting	disgusting	0.005	0.001	0.007	0.945	0.042	0.000
disgusting	disgusting	0.005	0.000	0.016	0.977	0.002	0.000

In the first row of disgusting data class, disgusting detected as disgusting with the value of confidence as mentioned below:

- Ranked Data
  1. Happy : 0.007 (Rank 4)
  2. Sad : 0.00 (Rank 5)
  3. Surprised : 0.011 (Rank 3)
  4. Disgusting : 0.95 (Rank 1)
  5. Angry : 0.031 (Rank 2)
  6. Fear : 0.00 (Rank 6)

- Angry Detection Ranking.

label	prediction(label)	confidence(happy)	confidence(sad)	confidence(surprised)	confidence(disgusting)	confidence(angry)	confidence(fear)
angry	angry	0.008	0.014	0.001	0.009	0.968	0.000
angry	angry	0.006	0.003	0.004	0.156	0.832	0.000
angry	angry	0.007	0.013	0.001	0.023	0.956	0.000
angry	angry	0.004	0.004	0.003	0.206	0.783	0.000
angry	angry	0.004	0.004	0.004	0.194	0.794	0.000
angry	angry	0.006	0.007	0.002	0.087	0.899	0.000
angry	angry	0.008	0.007	0.002	0.033	0.949	0.000
angry	angry	0.008	0.007	0.002	0.096	0.888	0.000
angry	angry	0.007	0.015	0.002	0.000	0.975	0.000
angry	angry	0.007	0.019	0.001	0.001	0.972	0.000

In the first row of angry data class, angry detected as angry with the value of confidence as mentioned below:

- Ranked Data
  1. Happy : 0.008 (Rank 4)
  2. Sad : 0.014 (Rank 2)
  3. Surprised : 0.001 (Rank 5)
  4. Disgusting : 0.009 (Rank 3)
  5. Angry : 0.968 (Rank 1)
  6. Fear : 0.00 (Rank 6)

- Fear Detection Ranking.

label	prediction(label)	confidence(happy)	confidence(sad)	confidence(surprised)	confidence(disgusting)	confidence(angry)	confidence(fear)
fear	fear	0.005	0.011	0.012	0.001	0.000	0.970
fear	fear	0.005	0.011	0.013	0.002	0.000	0.970
fear	fear	0.006	0.010	0.014	0.001	0.000	0.970
fear	fear	0.005	0.011	0.013	0.002	0.000	0.969
fear	fear	0.005	0.009	0.014	0.002	0.000	0.970
fear	fear	0.007	0.013	0.012	0.001	0.000	0.968
fear	fear	0.003	0.011	0.012	0.004	0.000	0.969
fear	fear	0.007	0.010	0.013	0.001	0.000	0.969
fear	fear	0.007	0.011	0.013	0.001	0.000	0.969
fear	fear	0.007	0.011	0.012	0.001	0.000	0.969

In the first row of fear data class, fear detected as fear with the value of confidence as mentioned below:

- Ranked Data
  1. Happy : 0.005 (Rank 4)
  2. Sad : 0.011 (Rank 3)
  3. Surprised : 0.012 (Rank 2)
  4. Disgusting : 0.001 (Rank 5)
  5. Angry : 0.00 (Rank 6)
  6. Fear : 0.970 (Rank 1)

2. Current Performance Report

We have obtained data from 5 people with 10 experiments for each emotion, the total of data is 300 data. We use Rapid Miner to check our current performance using cross validation 10 folds. We use NN and KNN here to compare the performance. The result of the performance can be seen as below.

- Neural Network.

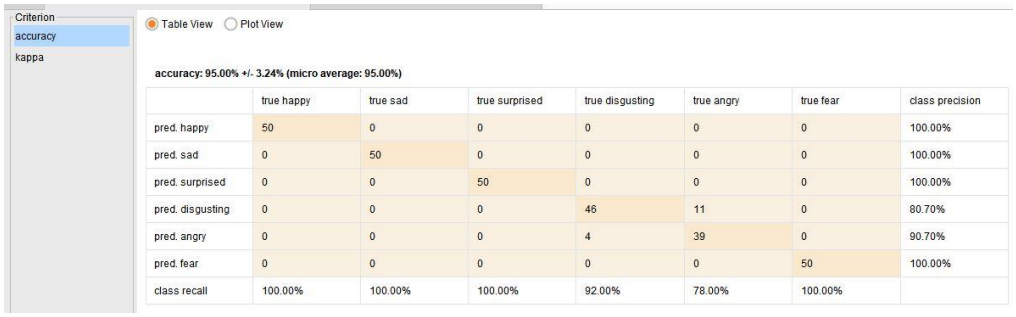
accuracy: 94.67% +/- 4.77% (micro average: 94.67%)

	true happy	true sad	true surprised	true disgusting	true angry	true fear	class precisi...
pred. happy	50	0	0	0	0	0	100.00%
pred. sad	0	50	0	0	0	0	100.00%
pred. surpris...	0	0	50	0	0	0	100.00%
pred. disgust...	0	0	0	44	10	0	81.48%
pred. angry	0	0	0	6	40	0	86.96%
pred. fear	0	0	0	0	0	50	100.00%
class recall	100.00%	100.00%	100.00%	88.00%	80.00%	100.00%	

We use NN with 200 training cycle, 0.01 learning rate and 0.9 momentum.

When using NN, we get 94.67% in accuracy total with 4.77% in deviation. Happy, sad, surprised and fear, all of their data have correctly classified with 100% accuracy and precision. 6 disgusting data wrongly classified and 44 correctly classified with accuracy 88% and precision 81.48. 10 angry data wrongly classified and 40 correctly classified with accuracy 80% and precision 86.96.

- K-NN



	true happy	true sad	true surprised	true disgusting	true angry	true fear	class precision
pred. happy	50	0	0	0	0	0	100.00%
pred. sad	0	50	0	0	0	0	100.00%
pred. surprised	0	0	50	0	0	0	100.00%
pred. disgusting	0	0	0	46	11	0	80.70%
pred. angry	0	0	0	4	39	0	90.70%
pred. fear	0	0	0	0	0	50	100.00%
class recall	100.00%	100.00%	100.00%	92.00%	78.00%	100.00%	

We use K-NN with K : 5 using Euclidean Distance.

When using K-NN, we get 95% in accuracy total with 3.24% in deviation. Happy, sad, surprised and fear, all of their data have correctly classified with 100% accuracy and precision. 4 disgusting data wrongly classified and 46 correctly classified with accuracy 92% and precision 80.70. 11 angry data wrongly classified and 39 correctly classified with accuracy 78% and precision 90.7%.