|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **19 800 train (aA) 4 950 test (aA) - praat**  275 occurrences pour chaque son  Img\_rows, img\_cols = 28, 28  Batch\_size, Epoch = 10, 115 | | | | |
| Entraînement | 1 | 2 | 3 | 4 |
| Première activation | tanh | relu | tanh | relu |
| loss | mean\_squared\_error | keras.losses.categorical\_crossentropy | keras.losses.categorical\_crossentropy | mean\_squared\_error |
| optimizeur | sgd | keras.optimizers.Adadelta | keras.optimizers.Adadelta | sgd |
| Total params | 54,146 | 54,146 | 54,146 | 54,146 |
| Trainable params | 54,146 | 54,146 | 54,146 | 54,146 |
| Non-trainable params | 0 | 0 | 0 | 0 |
| Early stopping | Epoch 00068 |  |  | Epoch 00068 |
| F-mesure pour nasal | 93% | 84% | 85% | 93% |
| F-mesure pour non nasal | 93% | 85% | 86% | 93% |
| Accuracy (F-mesure) | 93% | 85% | 85% | 93% |
| Locuteur avec meilleur score | 27\_11\_07\_nb1\_2\_16 (99% : 99% non nasal / 99% nasal) | 27\_11\_07\_nb2\_2\_16 (93% : 93% non nasal / 92% nasal) | 16\_11\_07\_nb1\_2\_16 (94% : 94% non nasal / 93% nasal) | 04\_12\_07\_nb1\_2\_16  22\_11\_07\_nb2\_1\_16  26\_11\_07\_nb2\_2\_16  30\_11\_07\_nb1\_2\_16  (97% : 97% non nasal / 97% nasal) |
| Locuteur avec score le + bas | 03\_12\_07\_nb1\_2\_16 (85% : 86% non nasal / 85% nasal)  29\_11\_07\_nb1\_2\_16 (85% : 87% non nasal / 84% nasal) | 30\_11\_07\_nb1\_1\_16(71% : 73% non nasal / 68% nasal) | 29\_11\_07\_nb1\_2\_16 (72% : 77% non nasal / 63% nasal) | 04\_12\_07\_nb2\_2\_16 (85% : 85% non nasal / 86% nasal)  29\_11\_07\_nb1\_2\_16 (85% : 86% non nasal / 82% nasal) |
| Confusion matrix |  |  |  |  |
| summary |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **19 800 train (aA) 5 040 test (aA / EI) - praat** | | | | |
| Entraînement | 1 | 2 | 3 | 4 |
| Première activation | tanh | relu | tanh | relu |
| loss | mean\_squared\_error | keras.losses.categorical\_crossentropy | keras.losses.categorical\_crossentropy | mean\_squared\_error |
| optimizeur | sgd | keras.optimizers.Adadelta | keras.optimizers.Adadelta | sgd |
| Total params | 54,146 | 54,146 | 54,146 | 54,146 |
| Trainable params | 54,146 | 54,146 | 54,146 | 54,146 |
| Non-trainable params | 0 | 0 | 0 | 0 |
| Early stopping | Epoch 00054 |  |  | Epoch 00065 |
| F-mesure pour nasal | 79% | 74% | 74% | 80% |
| F-mesure pour non nasal | 80% | 76% | 75% | 80% |
| Accuracy (F-mesure) | 80% | 75% | 75% | 80% |
| Locuteur avec meilleur score | 27\_11\_07\_nb1\_2\_16 (87% : 88% non nasal / 85% nasal) | 04\_12\_07\_nb1\_2\_16 (84% : 84% non nasal / 84% nasal) | 04\_12\_07\_nb1\_2\_16 (83% : 83% non nasal / 83% nasal) | 05\_12\_07\_nb1\_2\_16 (89% : 89% non nasal / 90% nasal) |
| Locuteur avec score le + bas | 29\_11\_07\_nb1\_2\_16 (64% : 66% non nasal / 62% nasal) | 29\_11\_07\_nb1\_2\_16 (57% : 63% non nasal / 50% nasal) | 29\_11\_07\_nb1\_2\_16 (58% : 64% non nasal / 51% nasal) | 29\_11\_07\_nb1\_2\_16 (62% : 63% non nasal / 62% nasal) |
| Confusion matrix |  |  |  |  |
| summary |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **9180 train (aA / EI) 2340 test (aA / EI) - praat** | | | | |
| Entraînement | 1 | 2 | 3 | 4 |
| Première activation | tanh | relu | tanh | relu |
| loss | mean\_squared\_error | keras.losses.categorical\_crossentropy | keras.losses.categorical\_crossentropy | mean\_squared\_error |
| optimizeur | sgd | keras.optimizers.Adadelta | keras.optimizers.Adadelta | sgd |
| Total params | 54,146 | 54,146 | 54,146 | 54,146 |
| Trainable params | 54,146 | 54,146 | 54,146 | 54,146 |
| Non-trainable params | 0 | 0 | 0 | 0 |
| Early stopping | Epoch 00068 |  |  | Epoch 00073 |
| F-mesure pour nasal | 89% | 71% | 71% | 88% |
| F-mesure pour non nasal | 89% | 79% | 78% | 89% |
| Accuracy (F-mesure) | 89% | 75% | 75% | 88% |
| Locuteur avec meilleur score | 26\_11\_07\_nb3\_1\_16 (96% : 96% non nasal / 96% nasal) | 16\_11\_07\_nb1\_1\_16 (92% : 92% non nasal / 92% nasal) | 04\_12\_07\_nb2\_2\_16 (87% : 86% non nasal / 87% nasal)  27\_11\_07\_nb2\_1\_16 (87% : 87% non nasal / 86% nasal) | 22\_11\_07\_nb1\_2\_16  26\_11\_07\_nb2\_2\_16  (98% : 98% non nasal / 98% nasal) |
| Locuteur avec score le + bas | 23\_11\_07\_nb1\_1\_16 (73% : 73% non nasal / 73% nasal) | 14\_11\_07\_nb2\_2\_16 (58% : 62% non nasal / 52% nasal) | 14\_11\_07\_nb1\_1\_16 (56% : 63% non nasal / 44% nasal)  14\_11\_07\_nb2\_2\_16 (56% : 60% non nasal / 46% nasal) | 27\_11\_07\_nb1\_1\_16 (77% : 76% non nasal / 78% nasal) |
| Confusion matrix |  |  |  |  |
| summary |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 |
| Train a/A - test a/A | 93% | 85% | 85% | 93% |
| Train a/A/E/I - test a/A/E/I | 89% | 75% | 75% | 88% |
| Train a/A - test a/A/E/I | 80% | 75% | 75% | 80% |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tronçons - 59 400 train (aA) 14 850 test (aA)** | | | | |
| Entraînement | 1 | 2 | 3 | 4 |
| Première activation | tanh | relu | tanh | relu |
| loss | mean\_squared\_error | keras.losses.categorical\_crossentropy | keras.losses.categorical\_crossentropy | mean\_squared\_error |
| optimizeur | sgd | keras.optimizers.Adadelta | keras.optimizers.Adadelta | sgd |
| Total params | 54,146 | 54,146 | 54,146 | 54,146 |
| Trainable params | 0 | 0 | 0 | 0 |
| Non-trainable params | 54,146 | 54,146 | 54,146 | 54,146 |
| Early stopping | Epoch 00072 |  |  | Epoch 00088 |
| F-mesure pour nasal | 85% | 80% | 80% | 86% |
| F-mesure pour non nasal | 85% | 81% | 81% | 85% |
| Accuracy (F-mesure) | 85% | 81% | 81% | 86% |
| Locuteur avec meilleur score | 04\_12\_07\_nb1\_2\_16 (92% : 92% non nasal / 93 % nasal) | 04\_12\_07\_nb1\_2\_16 (89% : 89% non nasal / 89% nasal) | 04\_12\_07\_nb1\_2\_16  23\_11\_07\_nb1\_1\_16  (90% : 90% non nasal / 90% nasal) | 04\_12\_07\_nb1\_2\_16 (92% : 92% non nasal / 93% nasal)  27\_11\_07\_nb1\_2\_16 (92% : 92% non nasal / 92% nasal) |
| Locuteur avec score le + bas | 29\_11\_07\_nb1\_2\_16 (74% : 76% non nasal / 72% nasal) | 29\_11\_07\_nb1\_2\_16 (68% : 72% non nasal / 63% nasal) | 29\_11\_07\_nb1\_2\_16 (68% : 72% non nasal / 64% nasal) | 29\_11\_07\_nb1\_2\_16 (76% : 77% non nasal / 75% nasal) |
| Tier avec meilleur score | 2 (88% : 88% non nasal / 88% nasal) | 2 (84% : 84% non nasal / 83% nasal) | 2 (84% : 85% non nasal / 84% nasal) | 2 (89% : 88% non nasal / 89% nasal) |
| Tier avec score le + bas | 1 (83% : 83% non nasal / 83% nasal) | 1 (78% : 79% non nasal / 77% nasal) | 1 (78% : 79% non nasal / 77% nasal) | 1 (84% : 83% non nasal / 84% nasal) |
| Confusion matrix |  |  |  |  |
| summary |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tronçons - 59 400 train (aA) 15 120 test (aAEI)** | | | | |
| Entraînement | 1 | 2 | 3 | 4 |
| Première activation | tanh | relu | tanh | relu |
| loss | mean\_squared\_error | keras.losses.categorical\_crossentropy | keras.losses.categorical\_crossentropy | mean\_squared\_error |
| optimizeur | sgd | keras.optimizers.Adadelta | keras.optimizers.Adadelta | sgd |
| Total params | 54,146 | 54,146 | 54,146 | 54,146 |
| Trainable params | 0 | 0 | 0 | 0 |
| Non-trainable params | 54,146 | 54,146 | 54,146 | 54,146 |
| Early stopping | Epoch 00072 |  | Epoch 00059 | Epoch 00068 |
| F-mesure pour nasal | 77% | 77% | 64% | 76% |
| F-mesure pour non nasal | 74% | 74% | 69% | 75% |
| Accuracy (F-mesure) | 75% | 75% | 67% | 76% |
| Locuteur avec meilleur score | 04\_12\_07\_nb3\_2\_16 (82% : 80% non nasal / 83% nasal)  05\_12\_07\_nb1\_2\_16 (82% : 81% non nasal / 84% nasal) | 04\_12\_07\_nb3\_2\_16 (81% : 80% non nasal / 81% nasal) | 04\_12\_07\_nb3\_2\_16 (76% : 77% non nasal / 75% nasal)  30\_11\_07\_nb1\_1\_16 (76% : 79% non nasal / 73% nasal) | 05\_12\_07\_nb1\_2\_16 (84% : 83% non nasal / 84% nasal) |
| Locuteur avec score le + bas | 29\_11\_07\_nb1\_2\_16 (60% : 60% non nasal / 59% nasal) | 29\_11\_07\_nb1\_2\_16 (58% : 61% non nasal / 54% nasal) | 29\_11\_07\_nb1\_2\_16 (55% : 59% non nasal / 51% nasal) | 29\_11\_07\_nb1\_2\_16 (60% : 61% non nasal / 60% nasal) |
| Tier avec meilleur score | 2 (77% : 75% non nasal / 78% nasal) | 2 (75% : 75% non nasal / 74% nasal) | 2 (68% : 71% non nasal / 65% nasal) | 2 (77% : 76% non nasal / 77% nasal) |
| Tier avec score le + bas | 1 (74% : 73% non nasal / 75% nasal) | 1 (71% : 72% non nasal / 71% nasal) | 1 (66% : 68% non nasal / 63% nasal) | 1 (74% : 74% non nasal / 74% nasal) |
| Confusion matrix |  |  |  |  |
| summary |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tronçons - 28080 train (aA) 6480 test (aAEI)** | | | | |
| Entraînement | 1 | 2 | 3 | 4 |
| Première activation | tanh | relu | tanh | relu |
| loss | mean\_squared\_error | keras.losses.categorical\_crossentropy | keras.losses.categorical\_crossentropy | mean\_squared\_error |
| optimizeur | sgd | keras.optimizers.Adadelta | keras.optimizers.Adadelta | sgd |
| Total params | 54,146 | 54,146 | 54,146 | 54,146 |
| Trainable params | 0 | 0 | 0 | 0 |
| Non-trainable params | 54,146 | 54,146 | 54,146 | 54,146 |
| Early stopping | Epoch 00065 |  |  |  |
| F-mesure pour nasal | 82% | 67% | 67% | 82% |
| F-mesure pour non nasal | 82% | 76% | 75% | 82% |
| Accuracy (F-mesure) | 82% | 72% | 72% | 82% |
| Locuteur avec meilleur score | 26\_11\_07\_nb2\_1\_16 (89% : 89% non nasal / 89% nasal) | 27\_11\_07\_nb2\_1\_16 (90% : 90% non nasal / 89% nasal) | 27\_11\_07\_nb2\_1\_16 (90% : 90% non nasal / 89% nasal) | 05\_12\_07\_nb1\_1\_16 (92% : 92% non nasal / 92% nasal) |
| Locuteur avec score le + bas | 23\_11\_07\_nb1\_2\_16 (70% : 70% non nasal / 71% nasal) | 23\_11\_07\_nb1\_2\_16 (60% : 66% non nasal / 53% nasal) | 23\_11\_07\_nb1\_2\_16 (60% : 65% non nasal / 52% nasal) | 23\_11\_07\_nb1\_2\_16 (71% : 71% non nasal / 71% nasal) |
| Tier avec meilleur score | 2 (84% : 84% non nasal / 84% nasal) | 2 (74% : 77% non nasal / 68% nasal) | 2 (73% : 77% non nasal / 68% nasal) | 2 (84% : 84% non nasal / 84% nasal) |
| Tier avec score le + bas | 1 (79% : 80% non nasal / 78% nasal) | 1 (70% : 74% non nasal / 65% nasal) | 1 (70% : 74% non nasal / 65% nasal) | 1 (79% : 79% non nasal / 79% nasal) |
| Confusion matrix |  |  |  |  |
| summary |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| tronçons | 1 | 2 | 3 | 4 |
| Train a/A - test a/A | 85% | 81% | 81% | 86% |
| Train a/A/E/I - test a/A/E/I | 82% | 72% | 72% | 82% |
| Train a/A - test a/A/E/I | 75% | 75% | 67% | 76% |

**Images python : 19 800 train (aA) 4 950 test (aA)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 275 occurrences pour chaque son  Img\_rows, img\_cols = 28, 28  Batch\_size, Epoch = 10, 115 | | | | |
| Entraînement | 1 | 2 | 3 | 4 |
| Première activation | tanh | relu | tanh | relu |
| loss | mean\_squared\_error | keras.losses.categorical\_crossentropy | keras.losses.categorical\_crossentropy | mean\_squared\_error |
| optimizeur | sgd | keras.optimizers.Adadelta | keras.optimizers.Adadelta | sgd |
| Total params | 54,146 | 54,146 | 54,146 | 54,146 |
| Trainable params | 54,146 | 54,146 | 54,146 | 54,146 |
| Non-trainable params | 0 | 0 | 0 | 0 |
| Early stopping | Epoch 00066 |  |  | Epoch 00069 |
| F-mesure pour nasal | 95% | 83% | 85% | 95% |
| F-mesure pour non nasal | 95% | 82% | 84% | 95% |
| Accuracy (F-mesure) | 95% | 83% | 85% | 95% |
| Locuteur avec meilleur score | 04\_12\_07\_nb1\_2\_16 (99% : 99% non nasal / 99% nasal) | 20\_11\_07\_nb1\_2\_16 (93% : 93% non nasal / 92% nasal) | 22\_11\_07\_nb1\_1\_16 (94% : 94% non nasal / 94% nasal) | 26\_11\_07\_nb3\_2\_16  30\_11\_07\_nb1\_2\_16  (99% : 99% non nasal / 99% nasal) |
| Locuteur avec score le + bas | 04\_12\_07\_nb3\_1\_16 (87%: 87% non nasal / 88% nasal) | 30\_11\_07\_nb1\_1\_16 (69%: 72% non nasal / 66% nasal) | 30\_11\_07\_nb1\_1\_16 (69%: 72% non nasal / 66% nasal) | 04\_12\_07\_nb3\_1\_16 (86% : 86% non nasal / 87% nasal) |
| Confusion matrix |  |  |  |  |
| summary |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Images python : 19 800 train (aA) 5040 test (aA\_EI)**  275 occurrences pour chaque son  Img\_rows, img\_cols = 28, 28  Batch\_size, Epoch = 10, 115 | | | | |
| Entraînement | 1 | 2 | 3 | 4 |
| Première activation | tanh | relu | tanh | relu |
| loss | mean\_squared\_error | keras.losses.categorical\_crossentropy | keras.losses.categorical\_crossentropy | mean\_squared\_error |
| Optimizeur | sgd | keras.optimizers.Adadelta | keras.optimizers.Adadelta | sgd |
| Total params | 54,146 | 54,146 | 54,146 | 54,146 |
| Trainable params | 54,146 | 54,146 | 54,146 | 54,146 |
| Non-trainable params | 0 | 0 | 0 | 0 |
| Early stopping | Epoch 00052 |  |  | Epoch 00060 |
| F-mesure pour nasal | 82% | 72% | 76% | 82% |
| F-mesure pour non nasal | 83% | 73% | 77% | 83% |
| Accuracy (F-mesure) | 82% | 72% | 76% | 83% |
| Locuteur avec meilleur score | 26\_11\_07\_nb2\_2\_16 (91% : 91% non nasal / 91% nasal) | 04\_12\_07\_nb1\_2\_16 (81% : 81% non nasal / 82% nasal) | 04\_12\_07\_nb1\_2\_16 (87% : 86% non nasal / 87% nasal) | 26\_11\_07\_nb2\_2\_16 (89% : 89% non nasal / 90% nasal) |
| Locuteur avec score le + bas | 16\_11\_07\_nb1\_2\_16 (68%: 70% non nasal / 65% nasal) | 29\_11\_07\_nb1\_2\_16 (60%: 66% non nasal / 51% nasal) | 29\_11\_07\_nb1\_2\_16 (60%: 66% non nasal / 51% nasal) | 16\_11\_07\_nb1\_2\_16 (69% : 70% non nasal / 67% nasal) |
| Confusion matrix |  |  |  |  |
| summary |  |  |  |  |