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| ufpe.jpg | **Universidade Federal de Pernambuco**  **Departamento de Engenharia Biomédica**  **Inteligência Artificial** | | |
| **Projeto de IA** | | |
| Alunos | Gabriel Galdino Gadelha  Gabriel Del  Roberto Leal | |
| Prof: | Wellington Pinheiro | Data: 16/06/2019 |

Base Conjunto:

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| **Método** | **Acurácia** | | **Kappa** | | **Tempo de treinamento** |
| **Média** | **Desvio Padrão** | **Média** | **Desvio Padrão** | **Média** |
| J48 | 66.97 | 2.43 | 0.34 | 0.05 | 659.90 |
| RandomForest  20 árvores | 69.64 | 2.17 | 0.39 | 0.04 | 963.90 |
| RandomForest  60 árvores | 71.21 | 1.93 | 0.42 | 0.04 | 2885.80 |
| RandomForest  100 árvores | 71.52 | 1.95 | 0.43 | 0.04 | 4815.70 |
| RandomTree | 64.05 | 2.21 | 0.28 | 0.04 | 91.20 |
| SMO PolyKernel  E 1.0 C 0.01 | 56.04 | 1.04 | 0.12| | 0.02 | 64.10 |
| SMO PolyKernel  E1.0 C 1 | 56.76 | 1.04 | 0.14 | 0.02 | 342.30 |
| SMO PolyKernel  E 1.0 C 100 | 62.01 | 2.06 | 0.24 | 0.04 | 24028.50 |
| SMO  RBFKernel  C 0.01 | 55.61 | 1.14 | 0.11 | 0.02 | 255875.80 |
| SMO  RBFKernel  C 1 | 56.02 | 1.05 | 0.12 | 0.02 | 73541.00 |
| SMO RBFKernel  C 100 | 56.92 | 1.36 | 0.14 | 0.03 | 69026.60 |
| SMO NormalizedPolyKernel  E 2.0 C 0.01 | 54.11 | 2.78 | 0.08 | 0.06 | 395049.30 |
| SMO  NormalizedPolyKernel  E2.0 C 1 | 56.28 | 1.04 | 0.13 | 0.02 | 125354.00 |
| SMO NormalizedPolyKernel  E 2.0 C 100 | 63.54 | 2.29 | 0.27 | 0.05 | 92575.10 |

Paciente 2:

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| **Método** | **Acurácia** | | **Kappa** | | **Tempo de treinamento** |
| **Média** | **Desvio Padrão** | **Média** | **Desvio Padrão** | **Média por Fold** |
| J48 | 77.20(5.35) | 81.40(5.50) 81.67(4.96) v 81.58(4.96) v 77.38(4.91) |  | 0.54(0.11) | 0.63(0.11) 0.63(0.10) v 0.63(0.10) v 0.55(0.10) |  | 29.22 | 37.19 109.69 v 182.66 v 3.28 \* |
| RandomForest  20 árvores |  |  |  |  |  |
| RandomForest  60 árvores |  |  |  |  |  |
| RandomForest  100 árvores |  |  |  |  |  |
| RandomTree |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 0.01 | 50.88(2.62) | 68.08(5.53) v 70.18(5.15) v 59.22(4.04) v 70.47(5.47) v 80.30(4.43) v 50.35(0.76) 50.65(1.18) 68.60(5.35) v 50.40( 0.82) 55.93(3.40) v 70.50(5.36) v |  | 0.02(0.05) | 0.36(0.11) v 0.40(0.10) v 0.18(0.08) v 0.41(0.11) v 0.61(0.09) v 0.01(0.02) 0.01(0.02) 0.37(0.11) v 0.01(0.02) 0.12(0.07) v 0.41(0.11) v |  | 5.00 | 7.19 93.28 v 88.91 v 107.81 v 1750.31 v 185.63 v 169.84 v 92.19 v 365.31 v 233.44 v 198.91 v |
| SMO PolyKernel  E1.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 100 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO PolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 100 |  |  |  |  |  |
| SMO  RBFKernel  C 0.01 |  |  |  |  |  |
| SMO  RBFKernel  C 1 |  |  |  |  |  |
| SMO RBFKernel  C 100 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO  NormalizedPolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 100 |  |  |  |  |  |

Paciente 3:

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| **Método** | **Acurácia** | | **Kappa** | | **Tempo de treinamento** |
| **Média** | **Desvio Padrão** | **Média** | **Desvio Padrão** | **Média** |
| J48 | 84.90(4.41) | 87.77(4.08) v 88.38(3.99) v 88.25(4.02) v 83.72(4.57) |  | 0.70(0.09) | 0.76(0.08) v 0.77(0.08) v 0.77(0.08) v 0.67(0.09) |  | 21.56 | 32.81 v 98.91 v 164.84 v 3.28 \* |
| RandomForest  20 árvores |  |  |  |  |  |
| RandomForest  60 árvores |  |  |  |  |  |
| RandomForest  100 árvores |  |  |  |  |  |
| RandomTree |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 0.01 | 51.37(4.97) | 84.30(4.39) v 86.10(4.74) v 81.03(4.92) v 86.35(4.75) v 86.67(4.90) v 52.60(6.17) 54.10(8.39) 84.82(4.61) v 53.47( 8.54) 81.03(4.68) v 86.55(4.79) v |  | 0.03(0.10) | 0.69(0.09) v 0.72(0.09) v 0.62(0.10) v 0.73(0.09) v 0.73(0.10) v 0.05(0.12) 0.08(0.17) 0.70(0.09) v 0.07(0.17) 0.62(0.09) v 0.73(0.10) v |  | 5.31 | 10.94 197.34 v 75.31 v 113.75 v 2567.97 v 163.91 v 155.00 v 91.25 v 354.06 v 229.22 v 189.53 v |
| SMO PolyKernel  E1.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 100 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO PolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 100 |  |  |  |  |  |
| SMO  RBFKernel  C 0.01 |  |  |  |  |  |
| SMO  RBFKernel  C 1 |  |  |  |  |  |
| SMO RBFKernel  C 100 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO  NormalizedPolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 100 |  |  |  |  |  |

Paciente 4:

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| **Método** | **Acurácia** | | **Kappa** | | **Tempo de treinamento** |
| **Média** | **Desvio Padrão** | **Média** | **Desvio Padrão** | **Média** |
| J48 | 75.75(5.41) | 78.62(4.31) 79.68(4.54) 79.75(4.63) v 71.85(5.23) |  | 0.51(0.11) | 0.57(0.09) 0.59(0.09) 0.60(0.09) v 0.44(0.10) |  | 28.91 | 40.00 v 117.97 v 195.47 v 4.06 \* |
| RandomForest  20 árvores |  |  |  |  |  |
| RandomForest  60 árvores |  |  |  |  |  |
| RandomForest  100 árvores |  |  |  |  |  |
| RandomTree |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 0.01 | 61.13(4.54) | 76.43(5.29) v 83.90(4.45) v 69.60(5.95) v 83.32(4.23) v 84.18(4.58) v 52.92(3.54) \* 64.63(5.53) v 78.68(4.89) v 58.07( 7.24) 70.67(5.66) v 83.53(4.51) v |  | 0.22(0.09) | 0.53(0.11) v 0.68(0.09) v 0.39(0.12) v 0.67(0.08) v 0.68(0.09) v 0.06(0.07) \* 0.29(0.11) v 0.57(0.10) v 0.16(0.14) 0.41(0.11) v 0.67(0.09) v |  | 5.78 | 15.16 v 418.12 v 74.06 v 188.91 v 11762.19 v 185.63 v 127.97 v 98.59 v 434.69 v 166.25 v 354.37 v |
| SMO PolyKernel  E1.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 100 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO PolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 100 |  |  |  |  |  |
| SMO  RBFKernel  C 0.01 |  |  |  |  |  |
| SMO  RBFKernel  C 1 |  |  |  |  |  |
| SMO RBFKernel  C 100 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO  NormalizedPolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 100 |  |  |  |  |  |

Paciente 5:

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| **Método** | **Acurácia** | | **Kappa** | | **Tempo de treinamento** |
| **Média** | **Desvio Padrão** | **Média** | **Desvio Padrão** | **Média** |
| J48 | 63.13(6.30) | 69.80(5.52) v 71.57(5.52) v 72.05(5.70) v 62.88(6.17) |  | 0.26(0.13) | 0.40(0.11) v 0.43(0.11) v 0.44(0.11) v 0.26(0.12) |  | 31.09 | 42.81 v 135.78 v 226.41 v 3.75 \* |
| RandomForest  20 árvores |  |  |  |  |  |
| RandomForest  60 árvores |  |  |  |  |  |
| RandomForest  100 árvores |  |  |  |  |  |
| RandomTree |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 0.01 | 50.52(1.25) | 63.90(6.47) v 68.67(5.83) v 58.25(6.11) v 66.52(5.79) v 70.32(6.12) v 50.87(1.73) 51.33(2.30) 63.63(6.59) v 51.10( 2.81) 58.15(5.87) v 66.65(5.84) v |  | 0.01(0.02) | 0.28(0.13) v 0.37(0.12) v 0.17(0.12) v 0.33(0.12) v 0.41(0.12) v 0.02(0.03) 0.03(0.05) 0.27(0.13) v 0.02(0.06) 0.16(0.12) v 0.33(0.12) v |  | 6.25 | 7.50 225.62 v 72.03 v 143.91 v 5895.16 v 153.59 v 116.09 v 94.06 v 246.88 v 199.22 v 251.09 v |
| SMO PolyKernel  E1.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 100 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO PolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 100 |  |  |  |  |  |
| SMO  RBFKernel  C 0.01 |  |  |  |  |  |
| SMO  RBFKernel  C 1 |  |  |  |  |  |
| SMO RBFKernel  C 100 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO  NormalizedPolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 100 |  |  |  |  |  |

Paciente 6:

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| **Método** | **Acurácia** | | **Kappa** | | **Tempo de treinamento** |
| **Média** | **Desvio Padrão** | **Média** | **Desvio Padrão** | **Média** |
| J48 | 60.97(5.20) | 64.45(6.47) 65.05(5.48) v 64.95(5.72) v 58.75(6.48) |  | 0.22(0.10) | 0.29(0.13) 0.30(0.11) v 0.30(0.11) v 0.17(0.13) |  | 18.13 | 46.41 v 141.56 v 235.47 v 4.53 \* |
| RandomForest  20 árvores |  |  |  |  |  |
| RandomForest  60 árvores |  |  |  |  |  |
| RandomForest  100 árvores |  |  |  |  |  |
| RandomTree |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 0.01 | 59.70(4.96) | 62.15(4.96) 66.68(5.95) v 60.67(5.28) 66.03(5.34) v 67.83(6.45) v 58.05(5.08) 60.20(5.52) 63.70(5.13) v 56.87( 6.12) 61.53(4.98) 66.78(5.44) v |  | 0.19(0.10) | 0.24(0.10) 0.33(0.12) v 0.21(0.11) 0.32(0.11) v 0.36(0.13) v 0.16(0.10) 0.20(0.11) 0.27(0.10) v 0.14(0.12) 0.23(0.10) 0.34(0.11) v |  | 6.09 | 10.78 682.19 v 76.09 v 228.44 v 27087.19 v 186.25 v 138.12 v 107.34 v 393.13 v 202.97 v 489.69 v |
| SMO PolyKernel  E1.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 100 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO PolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 100 |  |  |  |  |  |
| SMO  RBFKernel  C 0.01 |  |  |  |  |  |
| SMO  RBFKernel  C 1 |  |  |  |  |  |
| SMO RBFKernel  C 100 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO  NormalizedPolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 100 |  |  |  |  |  |

Paciente 7:

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| **Método** | **Acurácia** | | **Kappa** | | **Tempo de treinamento** |
| **Média** | **Desvio Padrão** | **Média** | **Desvio Padrão** | **Média** |
| J48 | 66.40(5.78) | 67.43(5.75) 68.78(6.19) 69.10(6.34) 62.57(6.43) |  | 0.33(0.12) | 0.35(0.12) 0.38(0.12) 0.38(0.13) 0.25(0.13) |  | 20.00 | 43.75 v 132.19 v 226.56 v 4.06 \* |
| RandomForest  20 árvores |  |  |  |  |  |
| RandomForest  60 árvores |  |  |  |  |  |
| RandomForest  100 árvores |  |  |  |  |  |
| RandomTree |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 0.01 | 52.60(2.23) | 71.13(5.68) v 69.35(6.22) v 68.80(5.64) v 69.82(5.84) v 71.17(6.07) v 52.18(2.50) 54.70(3.04) v 70.35(6.00) v 51.68( 3.27) 68.68(5.73) v 69.63(6.10) v |  | 0.05(0.04) | 0.42(0.11) v 0.39(0.12) v 0.38(0.11) v 0.40(0.12) v 0.42(0.12) v 0.04(0.05) 0.09(0.06) v 0.41(0.12) v 0.03(0.07) 0.37(0.11) v 0.39(0.12) v |  | 4.84 | 10.00 313.91 v 77.19 v 140.94 v 7182.66 v 175.63 v 126.41 v 93.59 v 331.88 v 218.28 v 345.00 v |
| SMO PolyKernel  E1.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 100 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO PolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 100 |  |  |  |  |  |
| SMO  RBFKernel  C 0.01 |  |  |  |  |  |
| SMO  RBFKernel  C 1 |  |  |  |  |  |
| SMO RBFKernel  C 100 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO  NormalizedPolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 100 |  |  |  |  |  |

Paciente 9:

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| **Método** | **Acurácia** | | **Kappa** | | **Tempo de treinamento** |
| **Média** | **Desvio Padrão** | **Média** | **Desvio Padrão** | **Média** |
| J48 | 77.82(5.60) | 81.57(4.70) v 82.25(4.45) v 82.38(4.47) v 74.42(5.40) |  | 0.56(0.11) | 0.63(0.09) v 0.65(0.09) v 0.65(0.09) v 0.49(0.11) |  | 21.56 | 39.22 v 119.22 v 292.66 v 3.59 \* |
| RandomForest  20 árvores |  |  |  |  |  |
| RandomForest  60 árvores |  |  |  |  |  |
| RandomForest  100 árvores |  |  |  |  |  |
| RandomTree |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 0.01 | 67.47(8.06) | 78.40(4.99) v 83.97(4.37) v 78.38(4.96) v 83.38(4.53) v 81.93(4.04) v 69.48(7.43) 70.73(6.38) 80.42(4.52) v 58.97(11.56) 79.62(4.70) v 84.50(4.02) v |  | 0.35(0.16) | 0.57(0.10) v 0.68(0.09) v 0.57(0.10) v 0.67(0.09) v 0.64(0.08) v 0.39(0.15) 0.41(0.13) 0.61(0.09) v 0.18(0.23) 0.59(0.09) v 0.69(0.08) v |  | 6.09 | 11.09 347.81 v 69.69 v 137.50 v 7082.03 v 184.84 v 139.84 v 85.31 v 362.03 v 160.62 v 398.28 v |
| SMO PolyKernel  E1.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 100 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO PolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 100 |  |  |  |  |  |
| SMO  RBFKernel  C 0.01 |  |  |  |  |  |
| SMO  RBFKernel  C 1 |  |  |  |  |  |
| SMO RBFKernel  C 100 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO  NormalizedPolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 100 |  |  |  |  |  |

Paciente 10:

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| **Método** | **Acurácia** | | **Kappa** | | **Tempo de treinamento** |
| **Média** | **Desvio Padrão** | **Média** | **Desvio Padrão** | **Média** |
| J48 | 99.87(0.51) | 100.00(0.00) 100.00(0.00) 100.00(0.00) 99.97(0.23) |  |  | 1.00(0.01) | 1.00(0.00) 1.00(0.00) 1.00(0.00) 1.00(0.00) | 7.81 | 11.72 23.91 v 39.06 v 0.47 \* |
| RandomForest  20 árvores |  |  |  |  |  |
| RandomForest  60 árvores |  |  |  |  |  |
| RandomForest  100 árvores |  |  |  |  |  |
| RandomTree |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 0.01 | 99.68(0.74) | 100.00(0.00) 100.00(0.00) 100.00(0.00) 100.00(0.00) 100.00(0.00) 92.63(3.07) \* 100.00(0.00) 100.00(0.00) 99.50( 1.02) 100.00(0.00) 100.00(0.00) |  |  | 0.99(0.01) | 1.00(0.00) 1.00(0.00) 1.00(0.00) 1.00(0.00) 1.00(0.00) 0.85(0.06) \* 1.00(0.00) 1.00(0.00) 0.99(0.02) 1.00(0.00) 1.00(0.00) | 5.16 | 4.06 4.37 11.87 6.88 7.19 195.62 v 32.34 v 7.19 199.53 v 13.44 v 7.97 |
| SMO PolyKernel  E1.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 1.0 C 100 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO PolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO PolyKernel  E 2.0 C 100 |  |  |  |  |  |
| SMO  RBFKernel  C 0.01 |  |  |  |  |  |
| SMO  RBFKernel  C 1 |  |  |  |  |  |
| SMO RBFKernel  C 100 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 0.01 |  |  |  |  |  |
| SMO  NormalizedPolyKernel  E2.0 C 1 |  |  |  |  |  |
| SMO NormalizedPolyKernel  E 2.0 C 100 |  |  |  |  |  |