Propositional intersting rules comparision

Pneumonia – scale semitones without mfcc

▣ (std(skwns) < 16.88) ∧ (std(mel10=1687Hz) ≥ 0.54) ∧ (bsd(mel14=3366Hz) ≥ 3.5) ∧ (3ac(mel8=1194Hz) ≥ 0.01) ↣ Healthy : (ninstances = 101, ncovered = 12, coverage = 0.12, confidence = 0.92, lift = 1.68, natoms = 4, height = 3)

▣ (std(skwns) < 16.88) ∧ (std(mel10=1687Hz) < 0.54) ∧ (min(mel8=1194Hz) < -4.2) ∧ (std(mel8=1194Hz) ≥ 0.19) ∧ (max(mel6=845Hz) ≥ -3.58) ∧ (std(mel6=845Hz) ≥ 0.48) ∧ (max(decrs) < 0.93) ↣ Pneumonia : (ninstances = 101, ncovered = 15, coverage = 0.15, confidence = 0.73, lift = 1.61, natoms = 7, height = 6)

▣ (std(skwns) < 16.88) ∧ (std(mel10=1687Hz) < 0.54) ∧ (min(mel8=1194Hz) < -4.2) ∧ (std(mel8=1194Hz) < 0.19) ↣ Pneumonia : (ninstances = 101, ncovered = 17, coverage = 0.17, confidence = 1.0, lift = 2.2, natoms = 4, height = 3)

▣ (std(skwns) ≥ 20.37) ∧ (std(mel9=1419Hz) ≥ 0.14) ∧ (med(mel9=1419Hz) < -3.28) ↣ Healthy : (ninstances = 101, ncovered = 22, coverage = 0.22, confidence = 0.95, lift = 1.75, natoms = 3, height = 2)

Pneumonia – scale semitones with mfcc

▣ (min(mfcc2) ≥ 1.5) ∧ (min(mfcc3) ≥ -0.53) ∧ (min(mel14=3366Hz) ≥ 0.0) ∧ (med(cntrd) < 19.89) ∧ (3ac(mfcc4) ≥ 0.0) ↣ Pneumonia : (ninstances = 101, ncovered = 27, coverage = 0.27, confidence = 0.96, lift = 1.91, natoms = 5, height = 4)

▣ (min(mfcc2) < 1.5) ∧ (max(mfcc4) ≥ 0.56) ∧ (mean(mfcc5) < 0.48) ∧ (med(mel11=2005Hz) < 0.0) ↣ Healthy : (ninstances = 101, ncovered = 37, coverage = 0.37, confidence = 0.86, lift = 1.75, natoms = 4, height = 3)

Pneumonia – scale mel_htk without mfcc

▣ (std(skwns) < 20.92) ∧ (std(mel15=1663Hz) < 0.42) ∧ (min(mel11=1179Hz) < -4.25) ∧ (std(mel13=1407Hz) < 0.2) ↣ Pneumonia : (ninstances = 101, ncovered = 19, coverage = 0.19, confidence = 1.0, lift = 1.91, natoms = 4, height = 3)

▣ (std(skwns) ≥ 20.92) ∧ (std(mel15=1663Hz) ≥ 0.17) ∧ (mean(mel17=1950Hz) < -4.13) ↣ Healthy : (ninstances = 101, ncovered = 20, coverage = 0.2, confidence = 0.95, lift = 2.0, natoms = 3, height = 2)

Pneumonia – scale mel_htk with mfcc

▣ (min(mfcc3) < -0.21) ∧ (min(mfcc2) ≥ 2.17) ∧ (med(mfcc7) ≥ -0.44) ∧ (mean(mfcc13) ≥ -0.08) ∧ (mean(mfcc9) < 0.2) ∧ (med(mel22=2829Hz) < 0.0) ↣ Pneumonia : (ninstances = 101, ncovered = 18, coverage = 0.18, confidence = 0.61, lift = 1.34, natoms = 6, height = 5)

▣ (min(mfcc3) < -0.21) ∧ (min(mfcc2) < 2.17) ∧ (max(mel3=488Hz) ≥ 0.0) ∧ (med(kurts) ≥ 143.69) ↣ Healthy : (ninstances = 101, ncovered = 27, coverage = 0.27, confidence = 0.89, lift = 1.63, natoms = 4, height = 3)

▣ (min(mfcc3) ≥ -0.21) ∧ (min(mfcc2) ≥ 1.92) ∧ (3ac(kurts) ≥ 0.01) ↣ Pneumonia : (ninstances = 101, ncovered = 28, coverage = 0.28, confidence = 0.93, lift = 2.04, natoms = 3, height = 2)

Bronchiectasis – scale semitones without mfcc

▣ std(decrs) < 2.77 ↣ Bronchiectasis : (ninstances = 36, ncovered = 18, coverage = 0.5, confidence = 1.0, lift = 2.0, natoms = 1, height = 0)

▣ std(decrs) ≥ 2.77 ↣ Healthy : (ninstances = 36, ncovered = 18, coverage = 0.5, confidence = 1.0, lift = 2.0, natoms = 1, height = 0)

Bronchiectasis – scale semitones with mfcc

▣ mean(decrs) ≥ -1.49 ↣ Bronchiectasis : (ninstances = 36, ncovered = 14, coverage = 0.39, confidence = 1.0, lift = 2.57, natoms = 1, height = 0)

▣ mean(decrs) < -1.49 ↣ Healthy : (ninstances = 36, ncovered = 22, coverage = 0.61, confidence = 1.0, lift = 1.64, natoms = 1, height = 0)

Bronchiectasis – scale mel_htk without mfcc

▣ med(decrs) < -0.75 ↣ Healthy : (ninstances = 36, ncovered = 16, coverage = 0.44, confidence = 1.0, lift = 2.12, natoms = 1, height = 0)

▣ med(decrs) ≥ -0.75 ↣ Bronchiectasis : (ninstances = 36, ncovered = 20, coverage = 0.56, confidence = 0.95, lift = 1.8, natoms = 1, height = 0)

Bronchiectasis – scale mel_htk with mfcc

▣ mean(crest) < 115.92 ↣ Bronchiectasis : (ninstances = 36, ncovered = 18, coverage = 0.5, confidence = 1.0, lift = 2.0, natoms = 1, height = 0)

▣ mean(crest) ≥ 115.92 ↣ Healthy : (ninstances = 36, ncovered = 18, coverage = 0.5, confidence = 1.0, lift = 2.0, natoms = 1, height = 0)

COPD – scale semitones without mfcc

▣ (med(entrp) < 0.21) ∧ (min(mel12=2383Hz) ≥ -8.02) ∧ (std(mel10=1687Hz) ≥ 0.15) ∧ (mean(slope) ≥ -0.03) ↣ Healthy : (ninstances = 110, ncovered = 26, coverage = 0.24, confidence = 0.96, lift = 1.86, natoms = 4, height = 3)

▣ (med(entrp) ≥ 0.23) ∧ (min(mel14=3366Hz) ≥ -5.87) ↣ COPD : (ninstances = 110, ncovered = 30, coverage = 0.27, confidence = 0.97, lift = 2.01, natoms = 2, height = 1)

COPD – scale semitones with mfcc

▣ (mean(crest) ≥ 120.66) ∧ (min(mfcc2) ≥ 1.55) ∧ (med(slope) < -0.02) ∧ (max(mfcc5) < 0.83) ∧ (max(mfcc6) ≥ 0.02) ↣ COPD : (ninstances = 110, ncovered = 18, coverage = 0.16, confidence = 0.89, lift = 1.55, natoms = 5, height = 4)

▣ (mean(crest) < 120.66) ∧ (qnt(mel6=845Hz) ≥ 1.73) ↣ COPD : (ninstances = 110, ncovered = 32, coverage = 0.29, confidence = 0.94, lift = 1.64, natoms = 2, height = 1)

▣ (mean(crest) ≥ 120.66) ∧ (min(mfcc2) < 1.55) ∧ (med(mel13=2832Hz) < 0.0) ∧ (mean(slope) ≥ -0.05) ↣ Healthy : (ninstances = 110, ncovered = 35, coverage = 0.32, confidence = 0.97, lift = 2.27, natoms = 4, height = 3)

COPD – scale mel_htk without mfcc

▣ (med(entrp) < 0.21) ∧ (min(mel23=3037Hz) < -8.13) ↣ COPD : (ninstances = 110, ncovered = 11, coverage = 0.1, confidence = 1.0, lift = 1.9, natoms = 2, height = 1)

▣ (med(entrp) ≥ 0.21) ∧ (max(rllff) < 601.56) ∧ (med(cntrd) ≥ 22.28) ↣ COPD : (ninstances = 110, ncovered = 33, coverage = 0.3, confidence = 0.97, lift = 1.84, natoms = 3, height = 2)

▣ (med(entrp) < 0.21) ∧ (min(mel23=3037Hz) ≥ -8.13) ∧ (min(mel2=421Hz) < -4.04) ∧ (std(mel13=1407Hz) ≥ 0.19) ∧ (max(mel3=488Hz) < 0.02) ↣ Healthy : (ninstances = 110, ncovered = 39, coverage = 0.35, confidence = 0.97, lift = 2.06, natoms = 5, height = 4)

COPD – scale mel_htk with mfcc

▣ (med(entrp) < 0.21) ∧ (min(mel26=3738Hz) ≥ 0.0) ∧ (min(mfcc3) < 0.0) ∧ (min(mel2=421Hz) ≥ 0.0) ∧ (mean(slope) ≥ -0.04) ↣ Healthy : (ninstances = 110, ncovered = 11, coverage = 0.1, confidence = 0.91, lift = 1.72, natoms = 5, height = 4)

▣ (med(entrp) < 0.21) ∧ (min(mel26=3738Hz) ≥ 0.0) ∧ (min(mfcc3) < 0.0) ∧ (min(mel2=421Hz) < 0.0) ↣ Healthy : (ninstances = 110, ncovered = 36, coverage = 0.33, confidence = 0.92, lift = 1.74, natoms = 4, height = 3)

▣ (med(entrp) ≥ 0.21) ∧ (min(mfcc3) ≥ -1.83) ∧ (qnt(mel2=421Hz) ≥ 1.76) ↣ COPD : (ninstances = 110, ncovered = 38, coverage = 0.35, confidence = 0.87, lift = 1.84, natoms = 3, height = 2)

URTI – scale semitones without mfcc

▣ (mean(skwns) ≥ 17.49) ∧ (min(mel1=357Hz) < -3.17) ∧ (mean(slope) < -0.02) ∧ (qnt(cntrd) < 2.05) ↣ Healthy : (ninstances = 86, ncovered = 10, coverage = 0.12, confidence = 0.6, lift = 1.12, natoms = 4, height = 3)

▣ (mean(skwns) ≥ 17.49) ∧ (min(mel1=357Hz) < -3.17) ∧ (mean(slope) < -0.02) ∧ (qnt(cntrd) ≥ 2.05) ∧ (max(mel10=1687Hz) ≥ -4.21) ∧ (std(decrs) < 8.13) ∧ (max(flatn) ≥ 0.0) ∧ (max(slope) < -0.0) ↣ Healthy : (ninstances = 86, ncovered = 10, coverage = 0.12, confidence = 0.7, lift = 1.31, natoms = 8, height = 7)

▣ (mean(skwns) < 17.49) ∧ (mean(mel4=599Hz) ≥ -5.19) ∧ (std(mel1=357Hz) ≥ 0.48) ∧ (3ac(mel3=504Hz) < 0.15) ∧ (qnt(mel14=3366Hz) ≥ 2.1) ↣ URTI : (ninstances = 86, ncovered = 10, coverage = 0.12, confidence = 0.9, lift = 1.94, natoms = 5, height = 4)

URTI – scale semitones with mfcc

▣ (mean(mfcc2) < 3.53) ∧ (med(mfcc2) ≥ 1.49) ∧ (max(mfcc3) ≥ 0.26) ∧ (qnt(kurts) < 2.14) ∧ (bsm(mfcc1) ≥ 10.5) ∧ (bsd(mfcc6) < 4.5) ↣ Healthy : (ninstances = 86, ncovered = 9, coverage = 0.1, confidence = 0.78, lift = 1.49, natoms = 6, height = 5)

▣ (mean(mfcc2) ≥ 3.53) ∧ (mean(mel3=504Hz) ≥ 0.0) ∧ (max(mel13=2832Hz) < 0.0) ↣ URTI : (ninstances = 86, ncovered = 14, coverage = 0.16, confidence = 0.86, lift = 1.8, natoms = 3, height = 2)

URTI – scale mel_htk without mfcc

▣ (mean(skwns) ≥ 17.49) ∧ (min(mel7=794Hz) ≥ -5.04) ∧ (min(mel16=1802Hz) ≥ -5.63) ∧ (3ac(mel10=1074Hz) ≥ 0.01) ∧ (med(flux) ≥ 1251.61) ∧ (min(mel9=975Hz) < -3.77) ∧ (std(decrs) < 6.8) ∧ (3ac(mel18=2106Hz) ≥ 0.02) ↣ Healthy : (ninstances = 86, ncovered = 9, coverage = 0.1, confidence = 0.67, lift = 1.27, natoms = 8, height = 7)

▣ (mean(skwns) < 17.49) ∧ (min(mel9=975Hz) ≥ -6.03) ∧ (mean(mel23=3037Hz) < -6.36) ↣ URTI : (ninstances = 86, ncovered = 16, coverage = 0.19, confidence = 0.94, lift = 1.97, natoms = 3, height = 2)

URTI – scale mel_htk with mfcc

▣ (min(mfcc2) ≥ 1.78) ∧ (mean(mfcc8) < 0.62) ∧ (med(mfcc9) < 0.3) ∧ (med(mfcc7) ≥ -0.41) ∧ (qnt(mel10=1074Hz) ≥ 1.96) ∧ (mean(mfcc13) ≥ -0.13) ∧ (std(mfcc9) < 0.22) ∧ (med(mel13=1407Hz) ≥ 0.0) ↣ URTI : (ninstances = 86, ncovered = 9, coverage = 0.1, confidence = 0.67, lift = 1.79, natoms = 8, height = 7)

▣ (min(mfcc2) ≥ 1.78) ∧ (mean(mfcc8) < 0.62) ∧ (med(mfcc9) ≥ 0.3) ∧ (med(mel4=558Hz) ≥ 0.0) ∧ (qnt(mel17=1950Hz) < 2.17) ↣ URTI : (ninstances = 86, ncovered = 10, coverage = 0.12, confidence = 0.4, lift = 1.08, natoms = 5, height = 4)

▣ (min(mfcc2) < 1.78) ∧ (std(slope) ≥ 0.01) ∧ (std(mel20=2447Hz) < 0.0) ∧ (bsd(mfcc8) ≥ 4.5) ∧ (3ac(mfcc2) ≥ 0.01) ∧ (min(mfcc11) ≥ -1.07) ↣ Healthy : (ninstances = 86, ncovered = 10, coverage = 0.12, confidence = 0.9, lift = 1.43, natoms = 6, height = 5)

▣ (min(mfcc2) ≥ 1.78) ∧ (mean(mfcc8) < 0.62) ∧ (med(mfcc9) < 0.3) ∧ (med(mfcc7) ≥ -0.41) ∧ (qnt(mel10=1074Hz) < 1.96) ∧ (med(mfcc13) < 0.2) ∧ (std(mel13=1407Hz) ≥ 0.0) ↣ URTI : (ninstances = 86, ncovered = 11, coverage = 0.13, confidence = 0.64, lift = 1.71, natoms = 7, height = 6)

▣ (min(mfcc2) < 1.78) ∧ (std(slope) ≥ 0.01) ∧ (std(mel20=2447Hz) < 0.0) ∧ (bsd(mfcc8) < 4.5) ↣ Healthy : (ninstances = 86, ncovered = 17, coverage = 0.2, confidence = 0.71, lift = 1.12, natoms = 4, height = 3)

Bronchiolitis – scale semitones without mfcc

▣ (mean(kurts) < 5761.28) ∧ (med(mel6=845Hz) < -3.25) ∧ (mean(entrp) < 0.21) ∧ (max(mel1=357Hz) ≥ -2.47) ∧ (mean(skwns) < 15.58) ∧ (std(mel3=504Hz) ≥ 0.57) ∧ (qnt(kurts) < 2.18) ↣ Bronchiolitis : (ninstances = 56, ncovered = 6, coverage = 0.11, confidence = 1.0, lift = 2.07, natoms = 7, height = 6)

▣ (mean(kurts) < 5761.28) ∧ (med(mel6=845Hz) < -3.25) ∧ (mean(entrp) ≥ 0.21) ∧ (min(skwns) < 3.35) ↣ Bronchiolitis : (ninstances = 56, ncovered = 14, coverage = 0.25, confidence = 0.93, lift = 1.93, natoms = 4, height = 3)

▣ mean(kurts) ≥ 5761.28 ↣ Healthy : (ninstances = 56, ncovered = 15, coverage = 0.27, confidence = 0.87, lift = 1.67, natoms = 1, height = 0)

Bronchiolitis – scale semitones with mfcc

▣ (max(mfcc2) < 6.36) ∧ (med(mfcc5) ≥ 0.11) ∧ (mean(crest) ≥ 134.78) ∧ (med(mfcc2) < 2.03) ↣ Healthy : (ninstances = 56, ncovered = 7, coverage = 0.12, confidence = 1.0, lift = 1.81, natoms = 4, height = 3)

▣ (max(mfcc2) ≥ 6.36) ∧ (med(skwns) < 15.43) ↣ Bronchiolitis : (ninstances = 56, ncovered = 9, coverage = 0.16, confidence = 0.78, lift = 1.74, natoms = 2, height = 1)

▣ (max(mfcc2) < 6.36) ∧ (med(mfcc5) < 0.11) ↣ Healthy : (ninstances = 56, ncovered = 10, coverage = 0.18, confidence = 0.9, lift = 1.63, natoms = 2, height = 1)

▣ (max(mfcc2) < 6.36) ∧ (med(mfcc5) ≥ 0.11) ∧ (mean(crest) < 134.78) ∧ (qnt(mel6=845Hz) ≥ 1.85) ∧ (mean(mel4=599Hz) ≥ 0.0) ↣ Bronchiolitis : (ninstances = 56, ncovered = 13, coverage = 0.23, confidence = 0.77, lift = 1.72, natoms = 5, height = 4)

Bronchiolitis – scale mel_htk without mfcc

▣ (med(kurts) < 1994.17) ∧ (mean(mel6=710Hz) < -2.96) ∧ (mean(cntrd) ≥ 24.17) ↣ Bronchiolitis : (ninstances = 56, ncovered = 6, coverage = 0.11, confidence = 1.0, lift = 2.24, natoms = 3, height = 2)

▣ (med(kurts) ≥ 1994.17) ∧ (max(mel9=975Hz) < -3.51) ↣ Healthy : (ninstances = 56, ncovered = 7, coverage = 0.12, confidence = 0.86, lift = 1.55, natoms = 2, height = 1)

▣ (med(kurts) ≥ 1994.17) ∧ (max(mel9=975Hz) ≥ -3.51) ∧ (min(mel10=1074Hz) ≥ -4.72) ∧ (3ac(flux) ≥ 0.01) ↣ Healthy : (ninstances = 56, ncovered = 8, coverage = 0.14, confidence = 0.62, lift = 1.13, natoms = 4, height = 3)

▣ (med(kurts) < 1994.17) ∧ (mean(mel6=710Hz) < -2.96) ∧ (mean(cntrd) < 24.17) ∧ (mean(mel13=1407Hz) ≥ -5.49) ∧ (mean(skwns) < 14.94) ∧ (bsm(mel22=2829Hz) < 11.0) ↣ Bronchiolitis : (ninstances = 56, ncovered = 10, coverage = 0.18, confidence = 0.9, lift = 2.02, natoms = 6, height = 5)

Bronchiolitis – scale mel_htk with mfcc

▣ (med(mfcc5) < 0.49) ∧ (max(flatn) ≥ 0.0) ∧ (med(decrs) ≥ -9.78) ↣ Healthy : (ninstances = 56, ncovered = 10, coverage = 0.18, confidence = 0.8, lift = 1.72, natoms = 3, height = 2)

▣ (med(mfcc5) ≥ 0.49) ∧ (max(rllff) < 593.75) ∧ (mean(crest) < 133.96) ∧ (std(mel8=882Hz) < 0.0) ↣ Bronchiolitis : (ninstances = 56, ncovered = 13, coverage = 0.23, confidence = 1.0, lift = 1.87, natoms = 4, height = 3)