

Appendix A: Supplemental Material

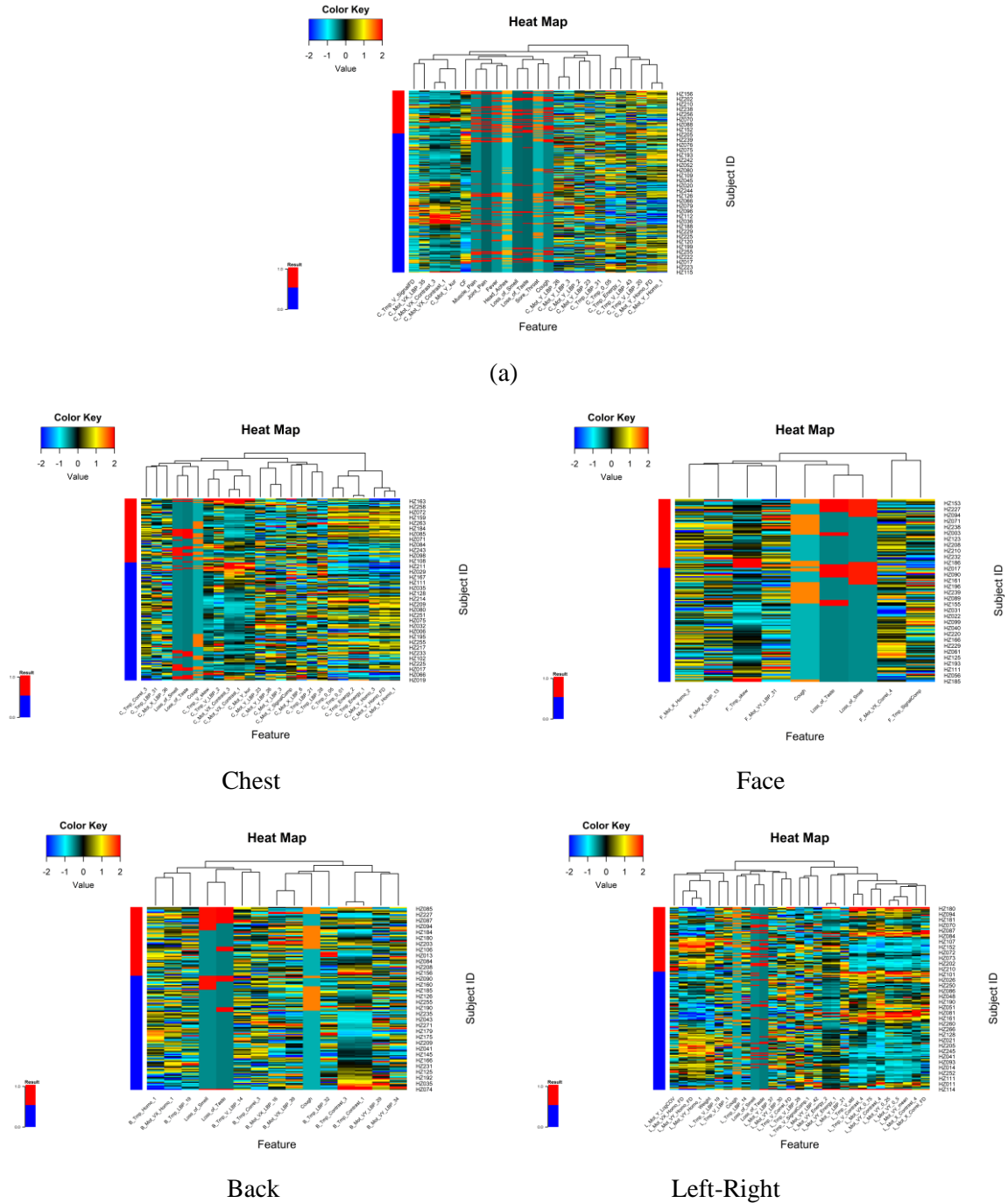


Fig. 1 Heat maps of top selected features for the chest view analysis. (a) Chest ROI: All subjects. (b) Only symptomatic subjects.

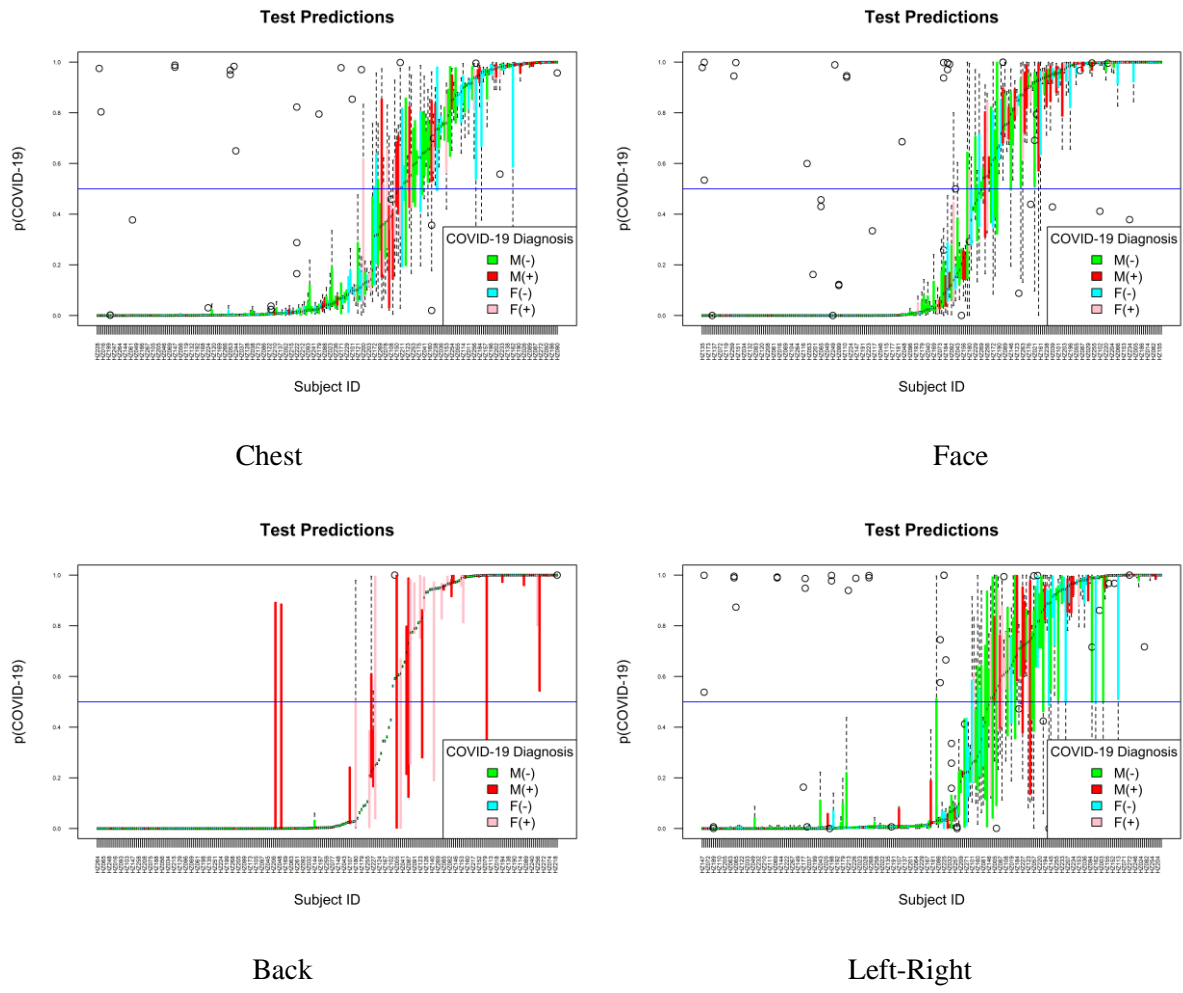
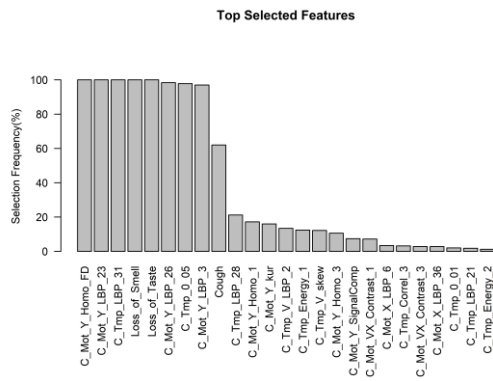
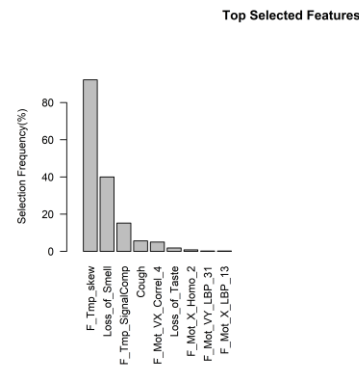


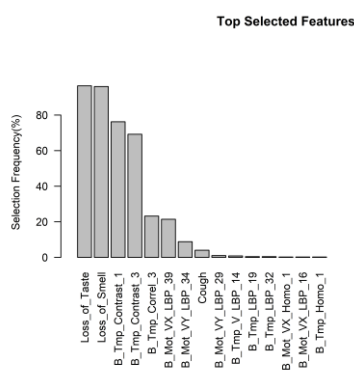
Fig. 2 Test results of each one of the 500 repetitions of the Random CrossValidation for the four explored body ROIs



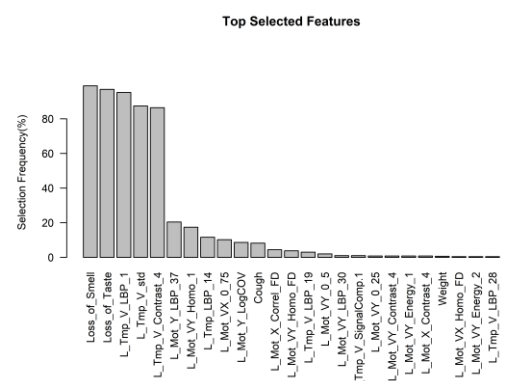
Chest



Face

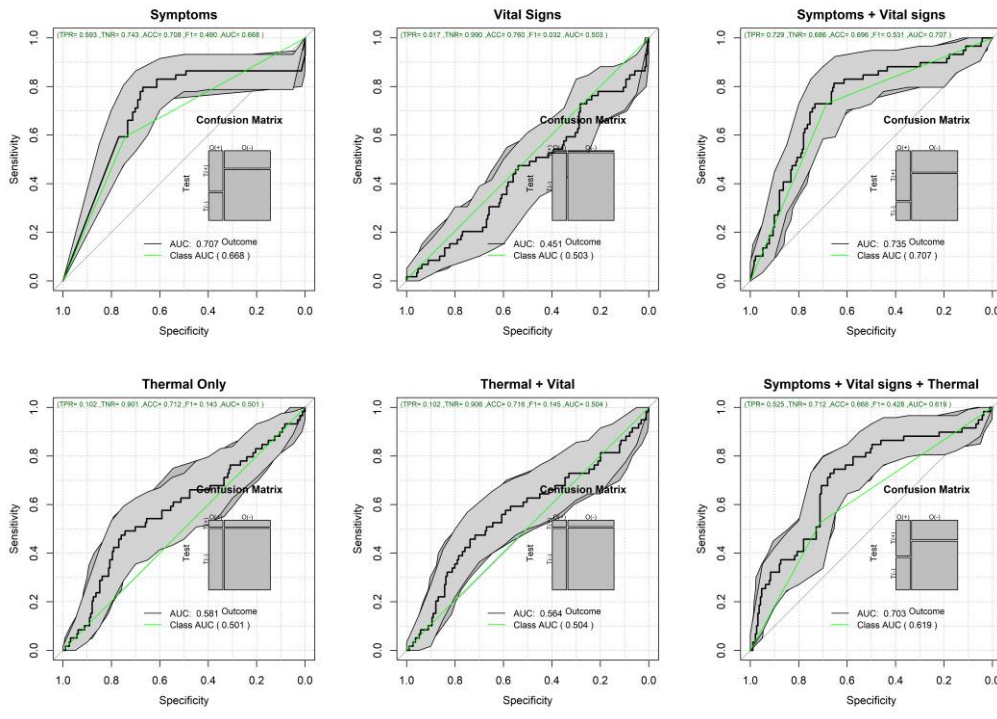


Back

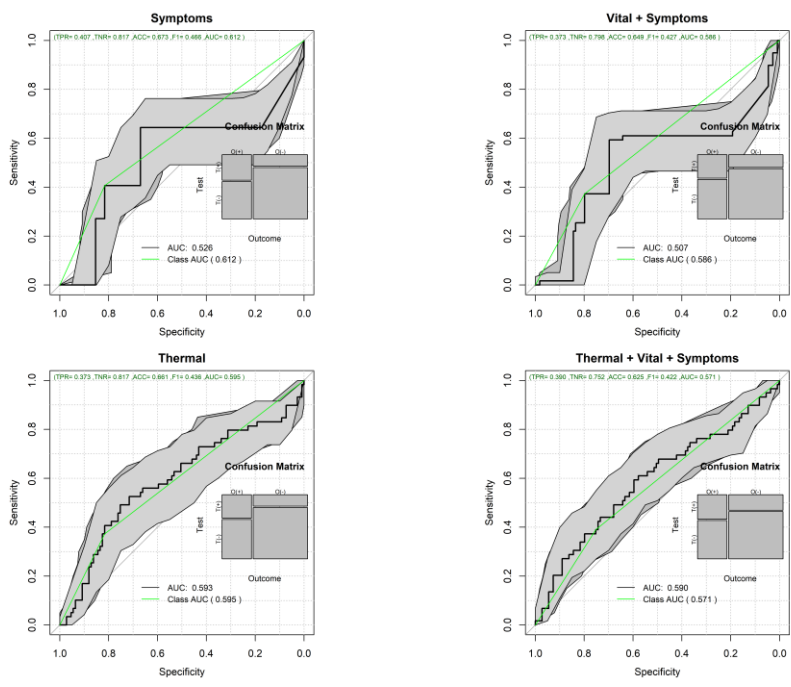


Left-Right

Fig. 3 Selection Frequency of Thermal Features at the different Body ROI

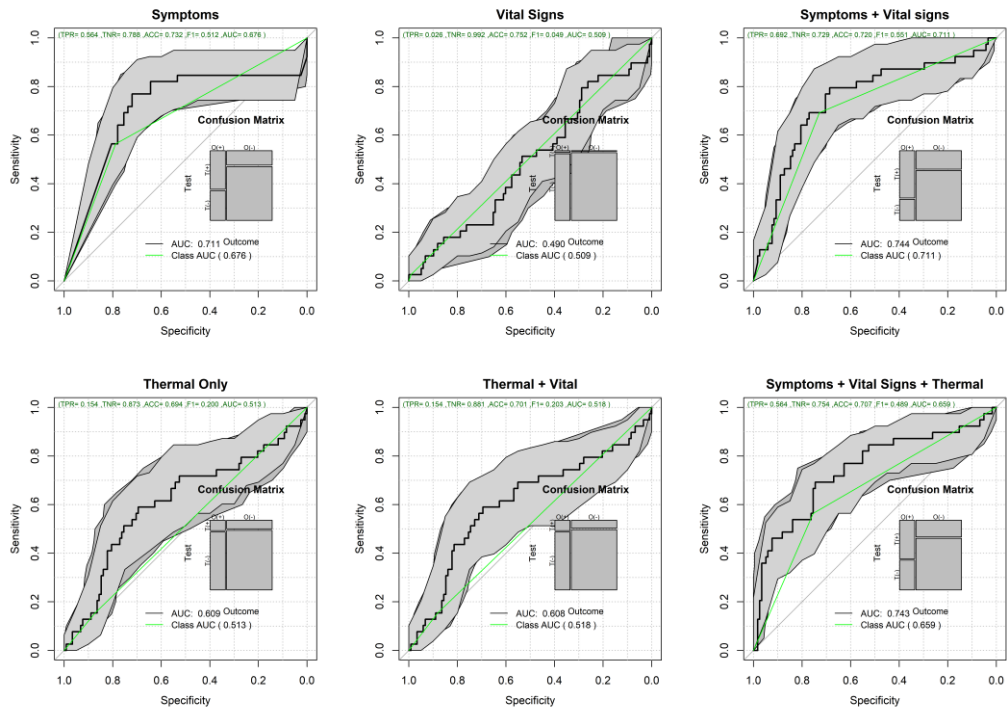


(a)

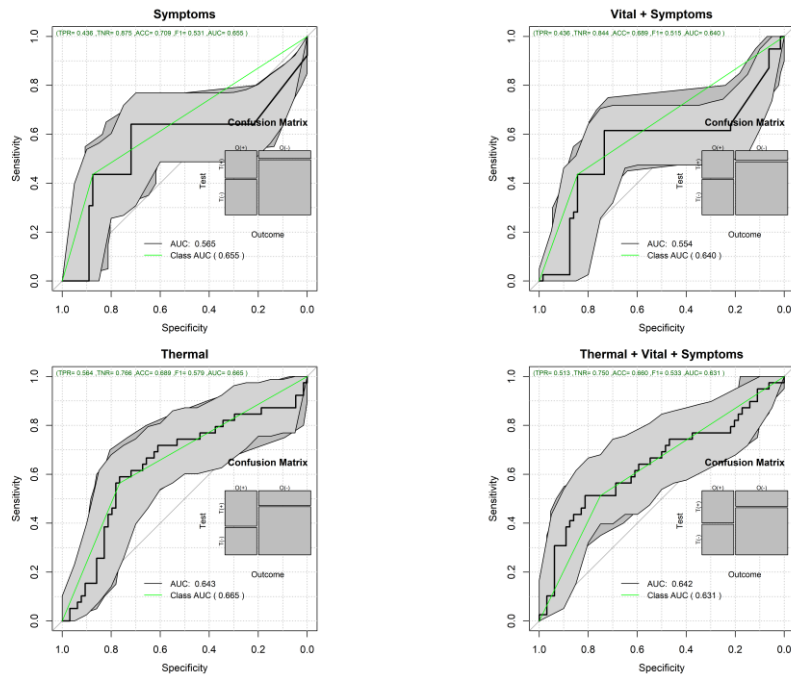


(b)

Fig. 4 ROC plots of the chest view using male and female subjects. (a) All subject data. (b) Only symptomatic subjects

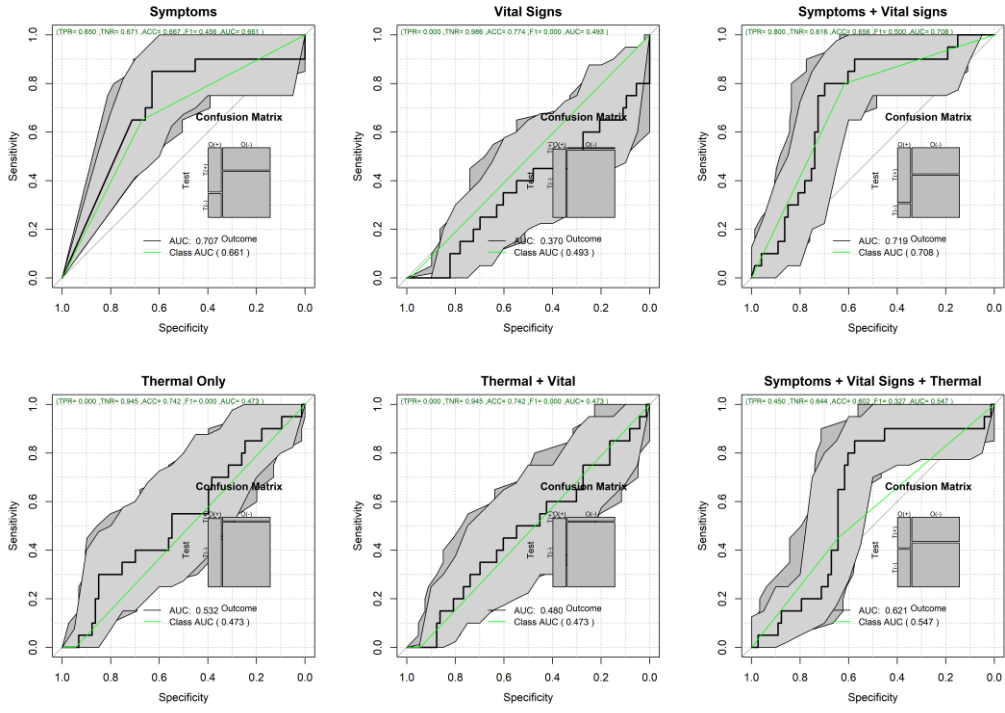


(a)

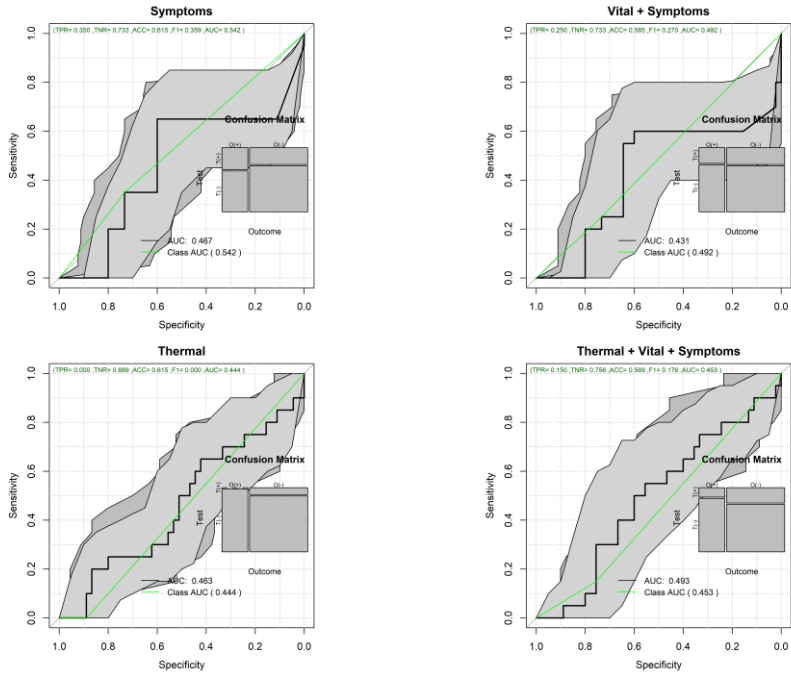


(b)

Fig. 5 ROC plots of the chest view form males. (a) All subject data. (b) Only symptomatic subjects



(a)



(b)

Fig. 6 ROC plots of the chest view for female subjects. (a) All subject data. (b) Only symptomatic subjects

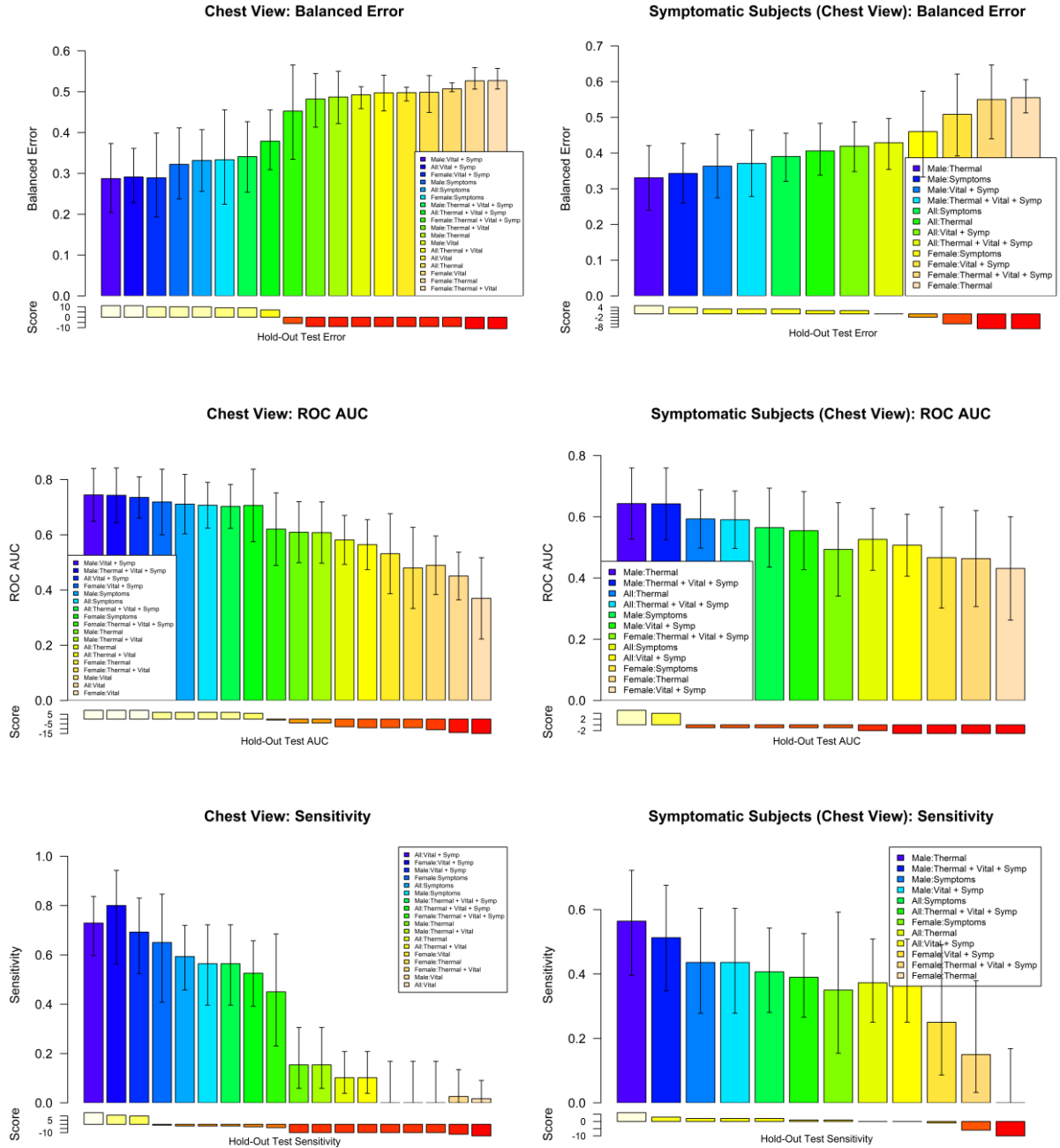


Fig. 7 Comparisons of key metrics for all subjects and symptomatic subjects of the chest view.

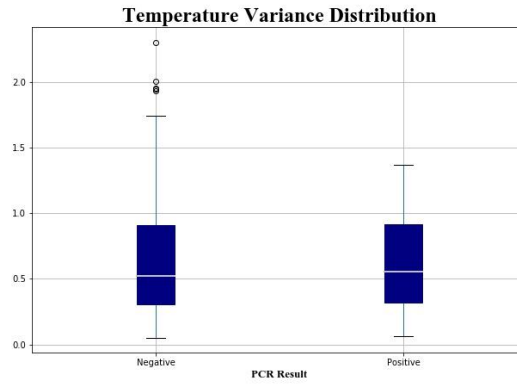


Fig. 8 Temperature variance distribution participants during the video capturing stratified by PCR results.

Table 1 Balanced error rate (BER) for all subject analysis

BER	Thermal				
	No Imaging	Chest	Face	Back	Left-Right
All:Symptoms	0.332 (0.26-0.41)				
All:Vital	0.498 (0.48-0.51)				
All:Vital + Symp	0.291 (0.23-0.36)				
All:Thermal		0.499 (0.45-0.54)	0.512 (0.49-0.53)	0.518 (0.49-0.54)	0.535 (0.52-0.55)
All:Thermal + Vital		0.497 (0.45-0.54)	0.512 (0.49-0.53)	0.518 (0.49-0.54)	0.532 (0.52-0.55)
All:Thermal + Vital + Symp		0.379 (0.31-0.46)	0.310 (0.24-0.39)	0.310 (0.24-0.38)	0.300 (0.24-0.37)
Male:Symptoms	0.322 (0.24-0.41)				
Male:Vital	0.492 (0.46-0.51)				
Male:Vital + Symp	0.287 (0.20-0.37)				
Male:Thermal		0.487 (0.42-0.55)	0.515 (0.48-0.54)	0.522 (0.48-0.56)	0.555 (0.53-0.59)
Male:Thermal + Vital		0.482 (0.41-0.54)	0.514 (0.48-0.54)	0.518 (0.48-0.55)	0.550 (0.53-0.58)

Male:Thermal + Vital + Symp		0.341 (0.25-0.43)	0.293 (0.21-0.38)	0.315 (0.23-0.40)	0.296 (0.21-0.38)
Female:Symptoms	0.333 (0.22-0.46)				
Female:Vital	0.507 (0.50-0.52)				
Female:Vital + Symp	0.289 (0.19-0.40)				
Female:Thermal		0.527 (0.51-0.56)	0.507 (0.50-0.53)	0.508 (0.50-0.53)	0.500 (0.50-0.50)
Female:Thermal + Vital		0.527 (0.51-0.56)	0.507 (0.50-0.52)	0.516 (0.50-0.54)	0.500 (0.50-0.50)
Female:Thermal + Vital + Symp		0.452 (0.33-0.57)	0.344 (0.23-0.47)	0.303 (0.20-0.43)	0.306 (0.20-0.41)

Table 2 Area under the ROC for all subjec analysis

AUC	Thermal				
	No Imaging	Chest	Face	Back	Left-Right
All:Symptoms	0.707 (0.62-0.79)				
All:Vital	0.451 (0.36-0.54)				
All:Vital + Symp	0.735 (0.66-0.81)				
All:Thermal		0.581 (0.49-0.67)	0.505 (0.41-0.60)	0.357 (0.28-0.43)	0.307 (0.23-0.38)
All:Thermal + Vital		0.564 (0.47-0.66)	0.523 (0.43-0.61)	0.352 (0.27-0.43)	0.331 (0.25-0.41)
All:Thermal + Vital + Symp		0.703 (0.62-0.78)	0.686 (0.60-0.77)	0.717 (0.64-0.80)	0.700 (0.62-0.78)
Male:Symptoms	0.711 (0.60-0.82)				
Male:Vital	0.490 (0.38-0.60)				
Male:Vital + Symp	0.744 (0.65-0.84)				
Male:Thermal		0.609 (0.50-0.72)	0.519 (0.41-0.63)	0.354 (0.26-0.45)	0.309 (0.22-0.40)
Male:Thermal + Vital		0.608 (0.50-0.72)	0.546 (0.43-0.66)	0.338 (0.24-0.44)	0.336 (0.24-0.43)
Male:Thermal + Vital + Symp		0.743 (0.64-0.84)	0.713 (0.61-0.82)	0.715 (0.61-0.82)	0.717 (0.61-0.82)
Female:Symptoms	0.707 (0.58-0.84)				
Female:Vital	0.370 (0.22-0.52)				
Female:Vital + Symp	0.719 (0.60-0.84)				
Female:Thermal		0.532 (0.39-0.68)	0.475 (0.32-0.63)	0.357 (0.22-0.49)	0.307 (0.18-0.44)
Female:Thermal + Vital		0.480 (0.33-0.63)	0.475 (0.33-0.63)	0.374 (0.24-0.51)	0.328 (0.19-0.46)
Female:Thermal + Vital + Symp		0.621 (0.49-0.75)	0.642 (0.51-0.78)	0.707 (0.59-0.83)	0.665 (0.53-0.80)

Table 3 Sensitivity for selecting COVID-19 patients using all subjects.

Sensitivity	Thermal				
	No Imaging	Chest	Face	Back	Left-Right
All:Symptoms	0.593 (0.46-0.72)				
All:Vital	0.017 (0.00-0.09)				
All:Vital + Symp	0.729 (0.60-0.84)				
All:Thermal		0.102 (0.04-0.21)	0.017 (0.00-0.09)	0.017 (0.00-0.09)	0.000 (0.00-0.06)
All:Thermal + Vital		0.102 (0.04-0.21)	0.017 (0.00-0.09)	0.017 (0.00-0.09)	0.000 (0.00-0.06)
All:Thermal + Vital + Symp		0.525 (0.39-0.66)	0.672 (0.54-0.79)	0.644 (0.51-0.76)	0.678 (0.54-0.79)
Male:Symptoms	0.564 (0.40-0.72)				
Male:Vital	0.026 (0.00-0.13)				
Male:Vital + Symp	0.692 (0.52-0.83)				
Male:Thermal		0.154 (0.06-0.31)	0.026 (0.00-0.14)	0.026 (0.00-0.13)	0.000 (0.00-0.09)
Male:Thermal + Vital		0.154 (0.06-0.31)	0.026 (0.00-0.14)	0.026 (0.00-0.13)	0.000 (0.00-0.09)
Male:Thermal + Vital + Symp		0.564 (0.40-0.72)	0.658 (0.49-0.80)	0.615 (0.45-0.77)	0.641 (0.47-0.79)
Female:Symptoms	0.650 (0.41-0.85)				
Female:Vital	0.000 (0.00-0.17)				
Female:Vital + Symp	0.800 (0.56-0.94)				
Female:Thermal		0.000 (0.00-0.17)	0.000 (0.00-0.17)	0.000 (0.00-0.17)	0.000 (0.00-0.17)
Female:Thermal + Vital		0.000 (0.00-0.17)	0.000 (0.00-0.17)	0.000 (0.00-0.17)	0.000 (0.00-0.17)
Female:Thermal + Vital + Symp		0.450 (0.23-0.68)	0.700 (0.46-0.88)	0.700 (0.46-0.88)	0.750 (0.51-0.91)

Table 4 Balanced Error Rate for symptomatic subjects

BER	Thermal				
	No Imaging	Chest	Face	Back	Left-Right
All:Symptoms	0.390 (0.32-0.46)				
All:Vital + Symp	0.419 (0.35-0.49)				
All:Thermal		0.406 (0.34-0.48)	0.442 (0.38-0.50)	0.531 (0.49-0.58)	0.476 (0.42-0.54)
All:Thermal + Vital + Symp		0.429 (0.35-0.50)	0.506 (0.44-0.57)	0.455 (0.38-0.53)	0.479 (0.41-0.55)
Male:Symptoms	0.343 (0.26-0.43)				
Male:Vital + Symp	0.363 (0.27-0.45)				
Male:Thermal		0.331 (0.24-0.42)	0.440 (0.36-0.51)	0.502 (0.44-0.57)	0.438 (0.37-0.51)
Male:Thermal + Vital + Symp		0.371 (0.28-0.46)	0.503 (0.43-0.57)	0.442 (0.35-0.53)	0.479 (0.39-0.57)
Female:Symptoms	0.460 (0.33-0.57)				
Female:Vital + Symp	0.508 (0.39-0.62)				
Female:Thermal		0.555 (0.51-0.61)	0.456 (0.34-0.55)	0.583 (0.53-0.65)	0.541 (0.44-0.63)
Female:Thermal + Vital + Symp		0.550 (0.44-0.65)	0.502 (0.39-0.61)	0.478 (0.35-0.59)	0.489 (0.37-0.60)

Table 5 Area under de ROC curve for only symptomatic subjects

AUC	Thermal				
	No Imaging	Chest	Face	Back	Left-Right
All:Symptoms	0.526 (0.43-0.63)				
All:Vital + Symp	0.507 (0.41-0.61)				
All:Thermal		0.593 (0.50-0.69)	0.595 (0.50-0.69)	0.386 (0.30-0.48)	0.567 (0.48-0.66)
All:Thermal + Vital + Symp		0.590 (0.50-0.68)	0.466 (0.37-0.56)	0.561 (0.47-0.66)	0.570 (0.48-0.66)
Male:Symptoms	0.565 (0.44-0.69)				
Male:Vital + Symp	0.554 (0.43-0.68)				
Male:Thermal		0.643 (0.53-0.76)	0.575 (0.46-0.69)	0.452 (0.34-0.57)	0.594 (0.48-0.71)
Male:Thermal + Vital + Symp		0.642 (0.53-0.76)	0.431 (0.31-0.55)	0.613 (0.50-0.73)	0.580 (0.46-0.70)
Female:Symptoms	0.467 (0.30-0.63)				
Female:Vital + Symp	0.431 (0.26-0.60)				
Female:Thermal		0.463 (0.31-0.62)	0.629 (0.47-0.79)	0.244 (0.12-0.37)	0.531 (0.38-0.68)
Female:Thermal + Vital + Symp		0.493 (0.34-0.65)	0.504 (0.34-0.67)	0.459 (0.29-0.63)	0.549 (0.40-0.70)

Table 6 Sensitivity of the model for symptomatic subjects

Sensitivity	Thermal				
	No Imaging	Chest	Face	Back	Left-Right
All:Symptoms	0.407 (0.28-0.54)				
All:Vital + Symp	0.373 (0.25-0.51)				
All:Thermal		0.373 (0.25-0.51)	0.207 (0.11-0.33)	0.068 (0.02-0.17)	0.186 (0.10-0.31)
All:Thermal + Vital + Symp		0.390 (0.27-0.53)	0.155 (0.07-0.27)	0.288 (0.18-0.42)	0.271 (0.16-0.40)
Male:Symptoms	0.436 (0.28-0.60)				
Male:Vital + Symp	0.436 (0.28-0.60)				
Male:Thermal		0.564 (0.40-0.72)	0.211 (0.10-0.37)	0.103 (0.03-0.24)	0.205 (0.09-0.37)
Male:Thermal + Vital + Symp		0.513 (0.35-0.68)	0.132 (0.04-0.28)	0.308 (0.17-0.48)	0.282 (0.15-0.45)
Female:Symptoms	0.350 (0.15-0.59)				
Female:Vital + Symp	0.250 (0.09-0.49)				
Female:Thermal		0.000 (0.00-0.17)	0.200 (0.06-0.44)	0.000 (0.00-0.17)	0.150 (0.03-0.38)
Female:Thermal + Vital + Symp		0.150 (0.03-0.38)	0.200 (0.06-0.44)	0.250 (0.09-0.49)	0.250 (0.09-0.49)