

Table S1. List of Features

Feature	Feature Class	Coeff. Sign Constraint	Description
female	Extractable	None	=1 if female
age_lt_30	Extractable	-	=1 if <30 years old
age_geq_30	Extractable	+	=1 if ≥30 years old
age_geq_45	Extractable	+	=1 if ≥45 years old
age_geq_60	Extractable	+	=1 if ≥60 years old
bmi_lt_25	Extractable	-	=1 if BMI <25
bmi_geq_25	Extractable	+	=1 if BMI ≥25
bmi_geq_30	Extractable	+	=1 if BMI ≥30
bmi_geq_35	Extractable	+	=1 if BMI ≥35
bmi_geq_40	Extractable	+	=1 if BMI ≥40
CHF	Extractable	+	=1 if checks box for history of heart failure
stroke	Extractable	+	=1 if checks box for history of stroke
pacemaker	Extractable	+	=1 if checks box for pacemaker
coronary disease	Extractable	+	=1 if checks box for history of coronary disease
HTN	Extractable	+	=1 if checks box for history of hypertension
diabetes	Extractable	+	=1 if checks box for history of diabetes
smoking	Extractable	+	=1 if checks box for current smoker
sleepiness	Symptoms	+	=1 if checks box for sleepiness
snoring	Symptoms	+	=1 if checks box for snoring
stops breathing	Symptoms	+	=1 if checks box for stops breathing in sleep
insomnia	Symptoms	+	=1 if checks box for insomnia
leg jerks	Symptoms	+	=1 if checks box for legs jerking during sleep
latency_ge_60	Symptoms	None	=1 if checks box for sleep latency >60 minutes
wakes_up_gt_3	Symptoms	None	=1 if checks box for waking up >3 times per night
Falls back slowly	Symptoms	None	=1 if checks box for difficulty falling back to sleep
caffeine_geq_2	Symptoms	+	=1 if checks box for caffeine ≥ twice daily
insomnia maint	Symptoms	+	=1 if checks box for difficulty maintaining sleep
gasping arousals	Symptoms	+	=1 if checks box for gasping arousals from sleep
dry mouth in AM	Symptoms	+	=1 if checks box for morning dry mouth
Tired regardless	Symptoms	+	=1 if checks box for tired regardless of sleep duration
ESS_geq_11	Symptoms	+	=1 if an ESS ≥11
depression	Symptoms	None	=1 if checks box for depression

BMI, body mass index; Coeff, coefficient; lt, less than; gt, greater than; geq, greater than or equal to; CHF, congestive heart failure; HTN, hypertension; latency refers to sleep onset (duration in minutes); wakes up refers to the self-reported number of awakenings per night; caffeine refers to the number of beverages per day; maint, maintenance insomnia; tired regardless refers to regardless of how much sleep has occurred; ESS, Epworth Sleepiness Scale

Table S2. Performance of other learning algorithms

Method	Additional Constraints	AUC (Range)		
		All	Extractable	Symptom
Lasso	-	0.797 (0.752 - 0.839)	0.778 (0.735 - 0.812)	0.696 (0.623 - 0.811)
Ridge	-	0.804 (0.749 - 0.862)	0.785 (0.716 - 0.833)	0.692 (0.614 - 0.814)
C5.0R	-	0.720 (0.649 - 0.784)	0.697 (0.653 - 0.788)	0.601 (0.562 - 0.655)
C5.0T	-	0.720 (0.643 - 0.783)	0.698 (0.653 - 0.776)	0.603 (0.564 - 0.659)
SVM Linear	-	0.802 (0.751 - 0.866)	0.777 (0.705 - 0.826)	0.679 (0.599 - 0.796)
SVM RBF	-	0.766 (0.717 - 0.807)	0.759 (0.706 - 0.816)	0.652 (0.592 - 0.711)
Elastic Net	-	0.793 (0.747 - 0.829)	0.778 (0.727 - 0.813)	0.693 (0.620 - 0.816)
Lasso (Size 5 + Sign)	Sign Constraints; Max 5 Features	0.733 (0.657 - 0.784)	0.751 (0.699 - 0.806)	0.682 (0.614 - 0.797)
Lasso (Size 10 + Sign)	Sign Constraints; Max 10 Features	0.783 (0.736 - 0.821)	0.776 (0.735 - 0.806)	0.686 (0.618 - 0.813)
SLIM (Size 5)	Sign Constraints; Max 5 Features; Integer Coeffs. between -10 and 10	0.772 (0.727 - 0.80)	0.770 (0.725 - 0.805)	0.676 (0.622 - 0.780)
SLIM (Size 10)	Sign Constraints; Max 10 Features; Integer Coeffs. between -20 and 20	0.785 (0.737 - 0.826)	0.775 (0.722 - 0.819)	0.670 (0.598 - 0.768)

AUC, Area Under Receiver Operator Curve (top of each cell contains the mean of 10-CV is at top of each cell with the minimum and maximum of the 10-CV at the bottom); size refers to the number of features in the model; Coefs. coefficients; Max, maximum; Sign refers to the directionality of the relation between a factor and the presence of OSA. The full names for each method can be found in the methods. Note that sometimes the performance with Extractable Features does better than the performance with All Features (see e.g. Lasso Size 5), which may be a random variation.

Table S3. Classifier performance details

Model (FPR Goal 20%)	TPR (Range)	FPR (Range)	LR+	LR-
Extractable (size 10)	64.2% (58.6 - 69.1)	23.0% (15.0 - 30.6)	2.8	0.46
Extractable (size 5)	61.6% (54.9 - 68.8)	20.8% (12.5 - 30.4)	3.0	0.48
Symptoms (size 10)	46.7% (39.1 - 59.6)	25.7% (10.0 - 41.7)	1.8	0.71
Model (FPR Goal 40%)	TPR (Range)	FPR (Range)	LR+	LR-
Extractable (size 10)	83.2% (77.4 - 89.9)	43.8% (33.3 - 51.4)	1.9	0.30
Extractable (size 5)	82.8% (77.4 - 88.1)	42.1% (33.3 - 52.5)	2.0	0.30
Symptoms (size 10)	69.0% (63.8 - 77.6)	45.7% (32.6 - 58.3)	1.5	0.57

TPR, true positive rate (10-CV mean on top; 10-CV min-max on bottom)

FPR, false positive rate (10-CV mean on top; 10-CV min-max on bottom)

LR+, positive likelihood ratio [sensitivity/(100-specificity)]

LR-, negative likelihood ratio [(100-sensitivity)/specificity]

Size refers to the number of features in the model