

Table S1 Comparisons of baseline ultrasound features for each task

Characteristics	Training set	Validation set	P
Task 1: nuclear grade	n=224	n=57	
Fat layer infiltration			0.786
Negative	161 (71.88)	42 (73.68)	
Positive	63 (28.12)	15 (26.32)	
Duct change			0.138
Negative	142 (63.39)	30 (52.63)	
Positive	82 (36.61)	27 (47.37)	
Structural distortion			0.860
Negative	215 (95.98)	55 (96.49)	
Positive	9 (4.02)	2 (3.51)	
Echogenic foci			0.516
Negative	113 (50.45)	26 (45.61)	
Positive	111 (49.55)	31 (54.39)	
Ultrasonographic manifestations			0.555
Mass type	107 (47.77)	30 (52.63)	
Non-mass type	117 (52.23)	27 (47.37)	
Background texture			0.603
Fat/fibroglandular	125 (55.80)	34 (59.65)	
Heterogeneous	99 (44.20)	23 (40.35)	
BI-RADS classification			0.065
3	6 (2.68)	1 (1.75)	
4A	54 (24.11)	9 (15.79)	
4B	80 (35.71)	19 (33.33)	
4C	64 (28.57)	20 (35.09)	
5	20 (8.93)	8 (14.04)	
Nuclear grade			0.655
Low	43 (19.20)	11 (19.30)	
Medium-to-high	181 (80.80)	46 (80.70)	
Task 2: ER	n=215	n=56	
Fat layer infiltration			0.715
Negative	156 (72.56)	42 (75.00)	
Positive	59 (27.44)	14 (25.00)	
Duct change			0.553
Negative	136 (63.26)	33 (58.93)	
Positive	79 (36.74)	23 (41.07)	
Structural distortion			0.564
Negative	208 (96.74)	55 (98.21)	
Positive	7 (3.26)	1 (1.79)	
Echogenic foci			0.129
Negative	109 (50.70%)	22 (39.29)	
Positive	106 (49.30)	34 (60.71)	
Ultrasonographic manifestations			0.074
Mass type	101 (46.98)	35 (62.50)	
Non-mass type	114 (53.02)	21 (37.50)	
Background texture			0.136
Fat/fibroglandular	120 (55.81)	25 (44.64)	
Heterogeneous	95 (44.19)	31 (55.36)	
BI-RADS classification			0.961
3	6 (2.79)	0 (0.00)	
4A	48 (22.33)	14 (25.00)	
4B	75 (34.88)	21 (37.50)	
4C	66 (30.70)	14 (25.00)	
5	20 (9.30)	7 (12.50)	
ER			0.558
Negative	75 (34.88)	21 (37.50)	
Positive	140 (65.12)	35 (62.50)	
Task 3: PR	n=214	n=56	
Fat layer infiltration			0.773
Negative	157 (73.36)	40 (71.43)	
Positive	57 (26.64)	16 (28.57)	
Duct change			0.795
Negative	134 (62.62)	34 (60.71)	
Positive	80 (37.38)	22 (39.29)	
Structural distortion			0.764
Negative	208 (97.20)	54 (96.43)	
Positive	6 (2.80)	2 (3.57)	
Echogenic foci			0.542
Negative	101 (47.20)	29 (51.79)	
Positive	113 (52.80)	27 (48.21)	
Ultrasonographic manifestations			0.088
Mass type	109 (50.93)	25 (44.64)	
Non-mass type	105 (49.07)	31 (55.36)	
Background texture			0.844
Fat/fibroglandular	114 (53.27)	29 (51.79)	
Heterogeneous	100 (46.73)	27 (48.21)	
BI-RADS classification			0.441
3	4 (1.87)	2 (3.57)	
4A	49 (22.90)	12 (21.43)	
4B	73 (34.11)	22 (39.29)	
4C	64 (29.91)	17 (30.36)	
5	24 (11.21)	3 (5.35)	
PR			0.456
Negative	83 (38.79)	24 (42.86)	
Positive	131 (61.21)	32 (57.14)	
Task 4: HER2	n=212	n=55	
Fat layer infiltration			0.898
Negative	156 (73.58)	40 (72.73)	
Positive	56 (26.42)	15 (27.27)	
Duct change			0.803
Negative	131 (61.79)	35 (63.64)	
Positive	81 (38.21)	20 (36.36)	
Structural distortion			0.037
Negative	208 (98.11)	51 (92.73)	
Positive	4 (1.89)	4 (7.27)	
Echogenic foci			0.427
Negative	99 (46.70)	29 (52.73)	
Positive	113 (53.30)	26 (47.27)	
Ultrasonographic manifestations			0.318
Mass type	109 (51.42)	25 (45.45)	
Non-mass type	103 (48.58)	30 (54.55)	
Background texture			0.870
Fat/fibroglandular	113 (53.30)	30 (54.55)	
Heterogeneous	99 (46.70)	25 (45.45)	
BI-RADS classification			0.456
3	4 (1.89)	1 (1.82)	
4A	49 (23.11)	12 (21.82)	
4B	77 (36.32)	18 (32.73)	
4C	63 (29.72)	16 (29.09)	
5	19 (8.96)	8 (14.54)	
HER2			0.979
Negative	148 (69.81)	38 (69.09)	
Positive	64 (30.19)	17 (30.91)	

Data are presented as number (percentage). ER, estrogen receptor; HER2, human epidermal growth factor receptor 2; PR, progesterone receptor.