

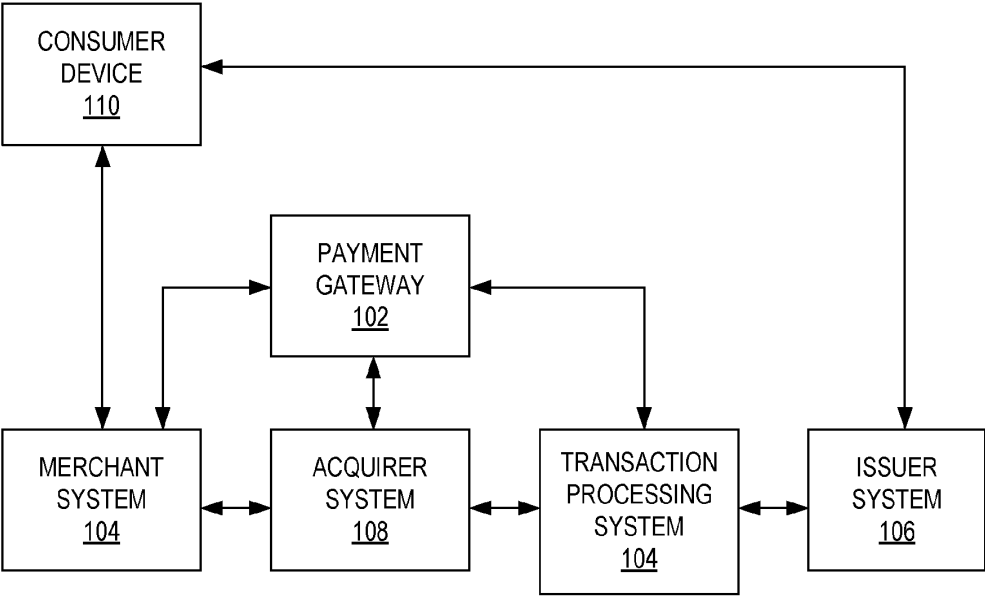


FIG. 1

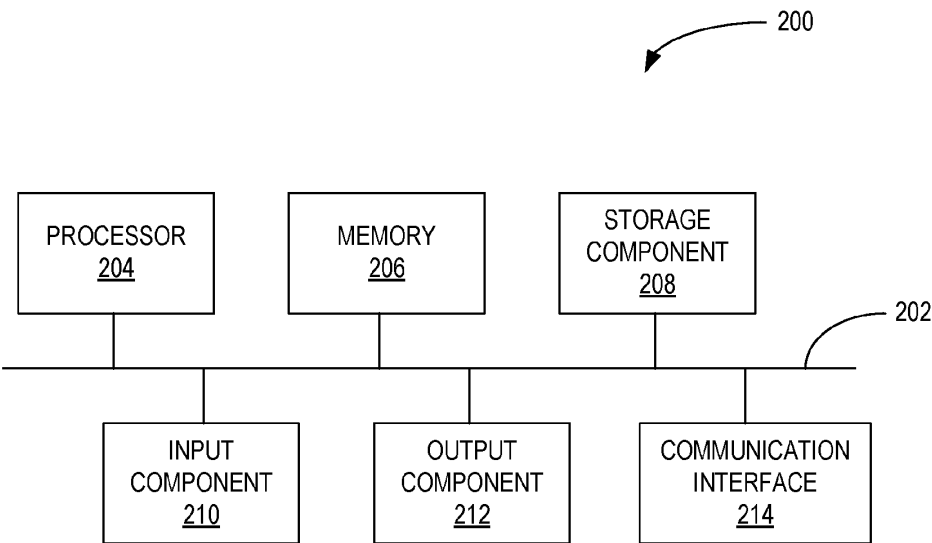


FIG. 2

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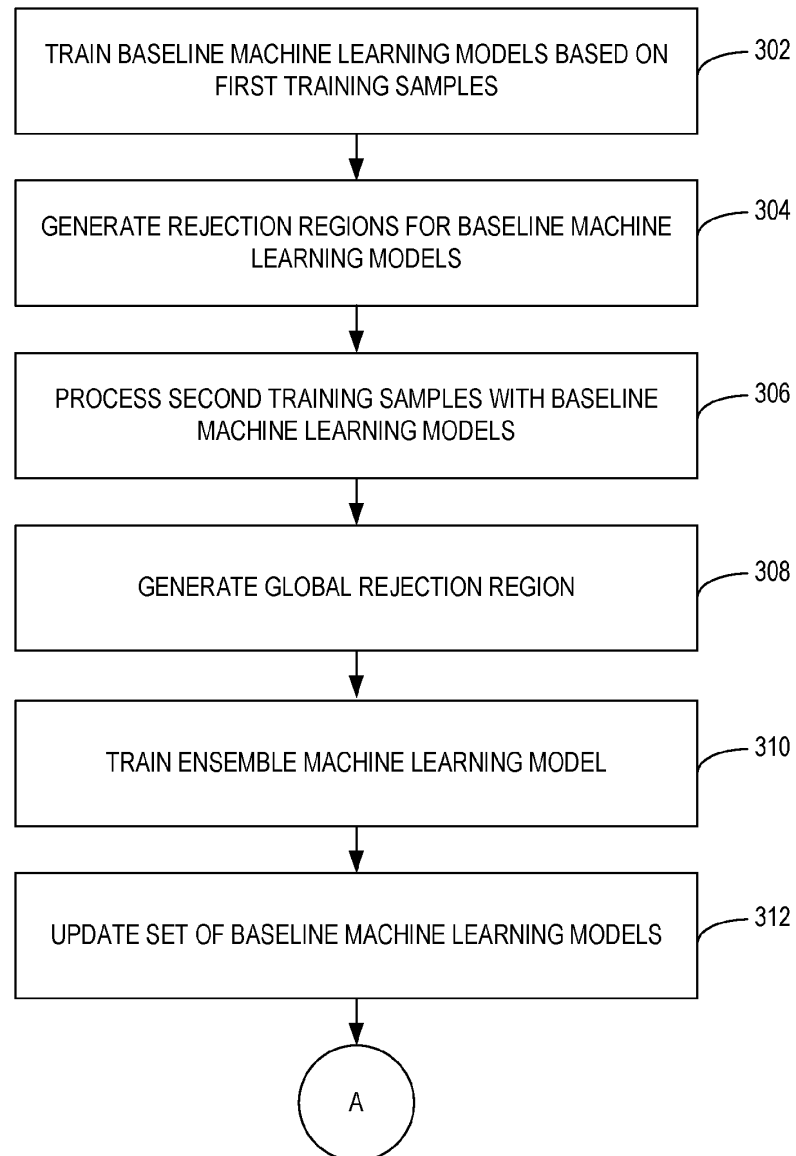
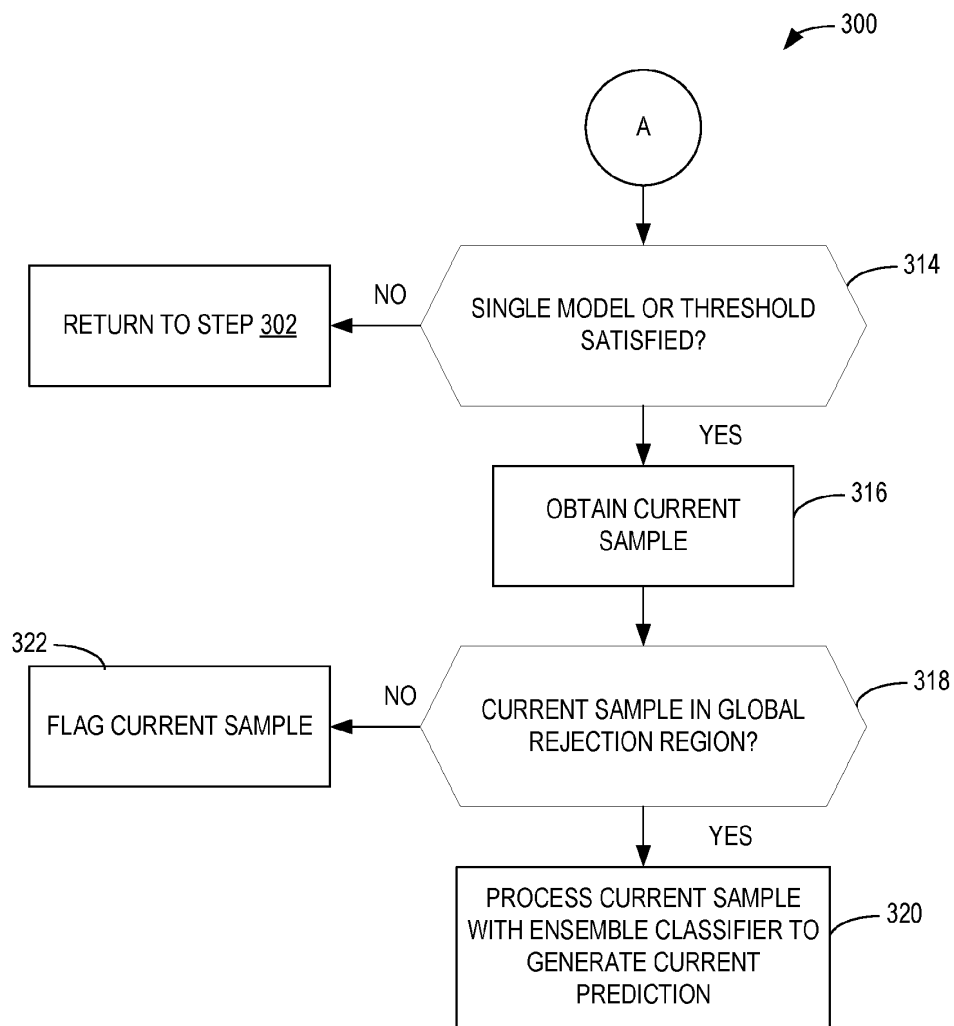


FIG. 3A

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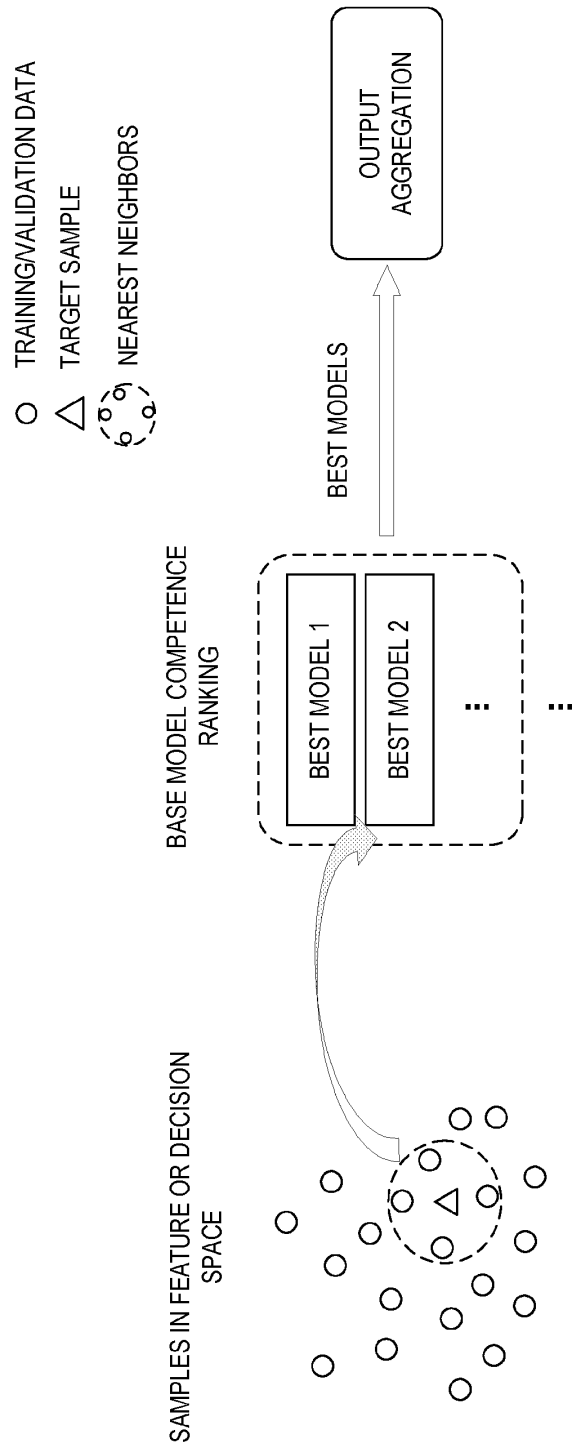


FIG. 4

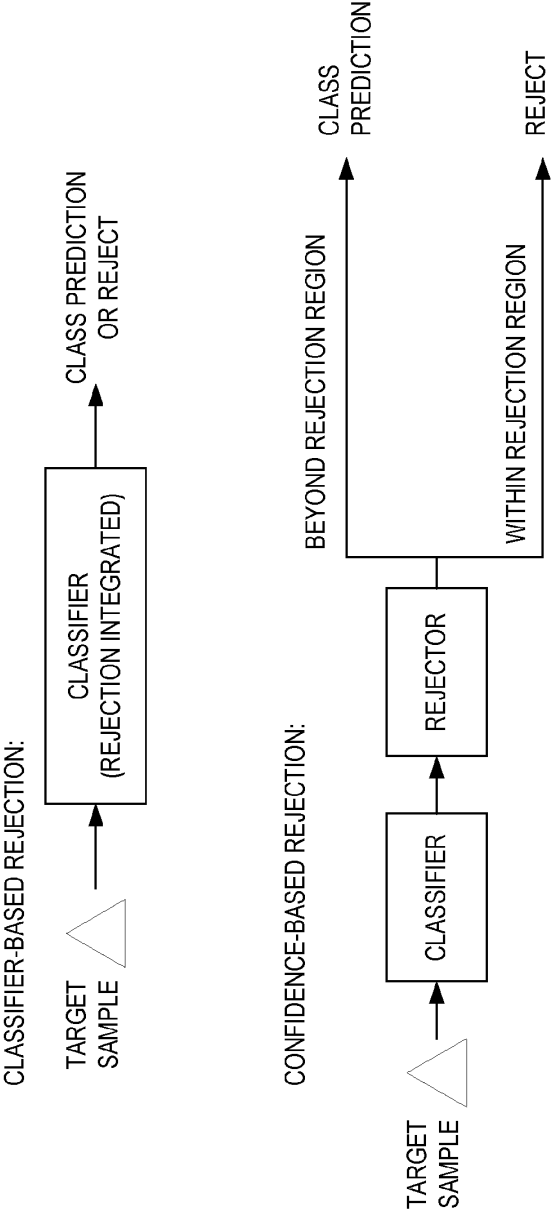


FIG. 5

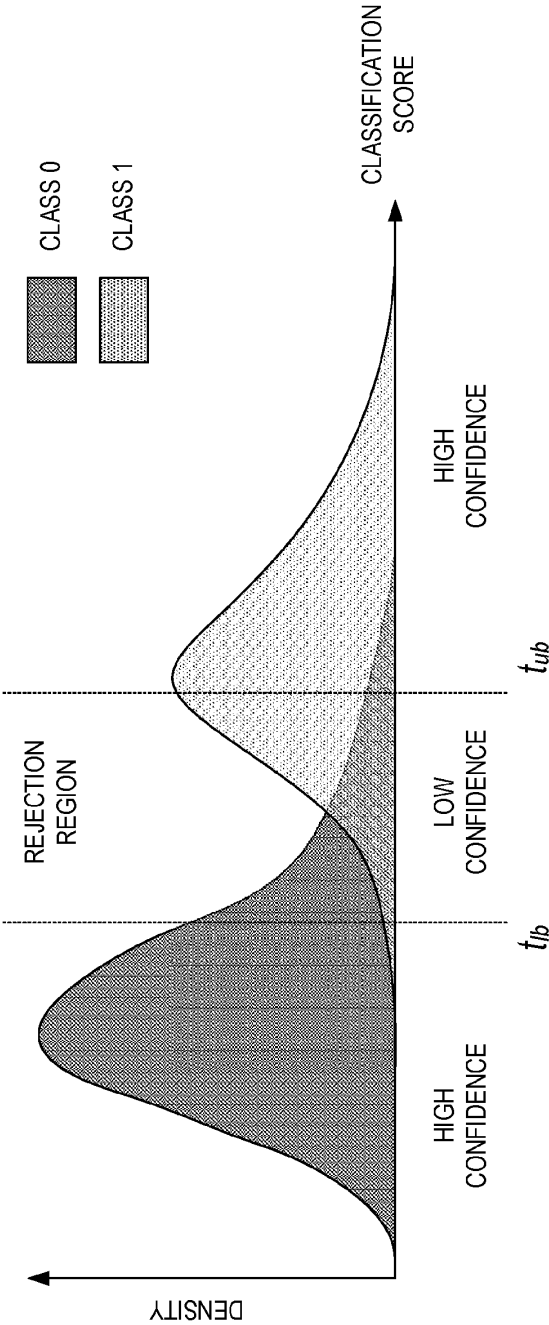


FIG. 6

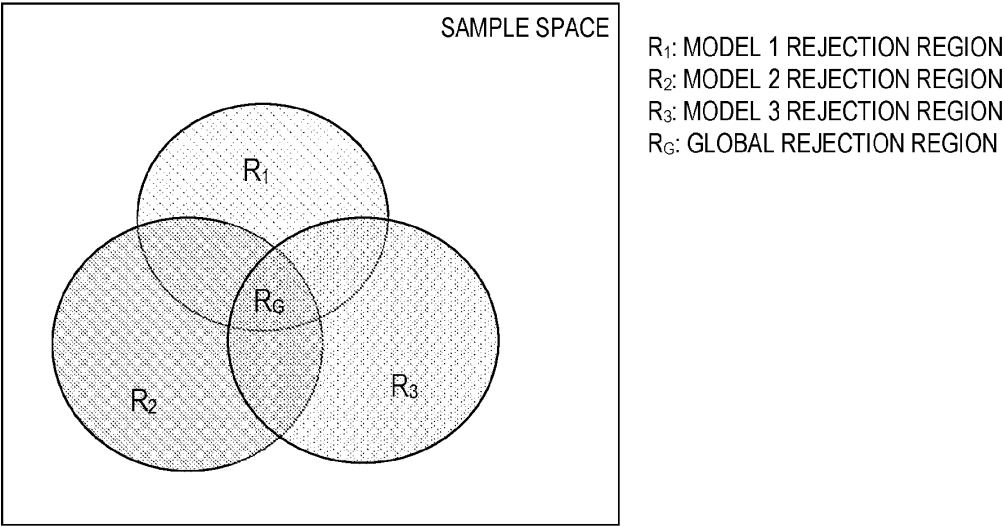


FIG. 7

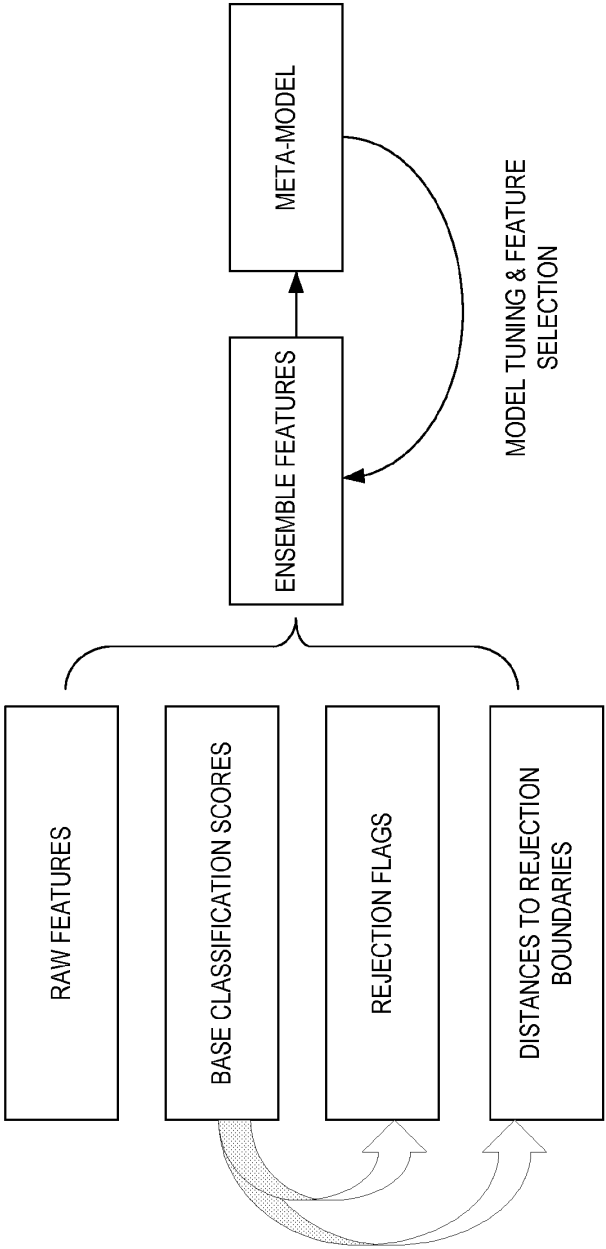


FIG. 8

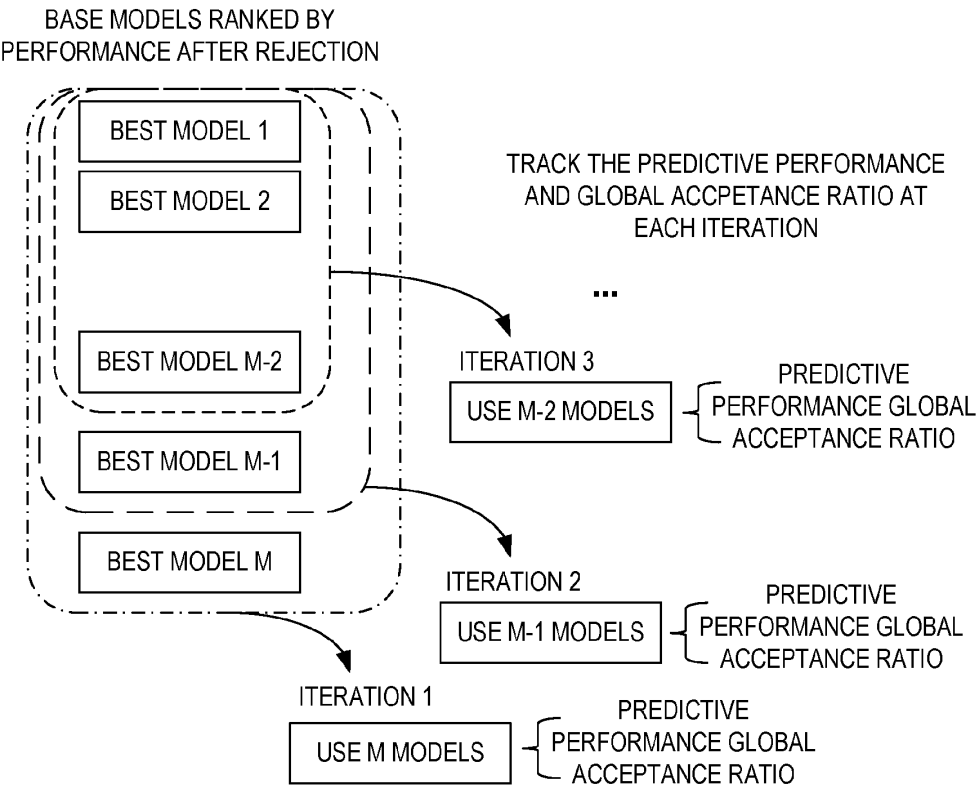


FIG. 9

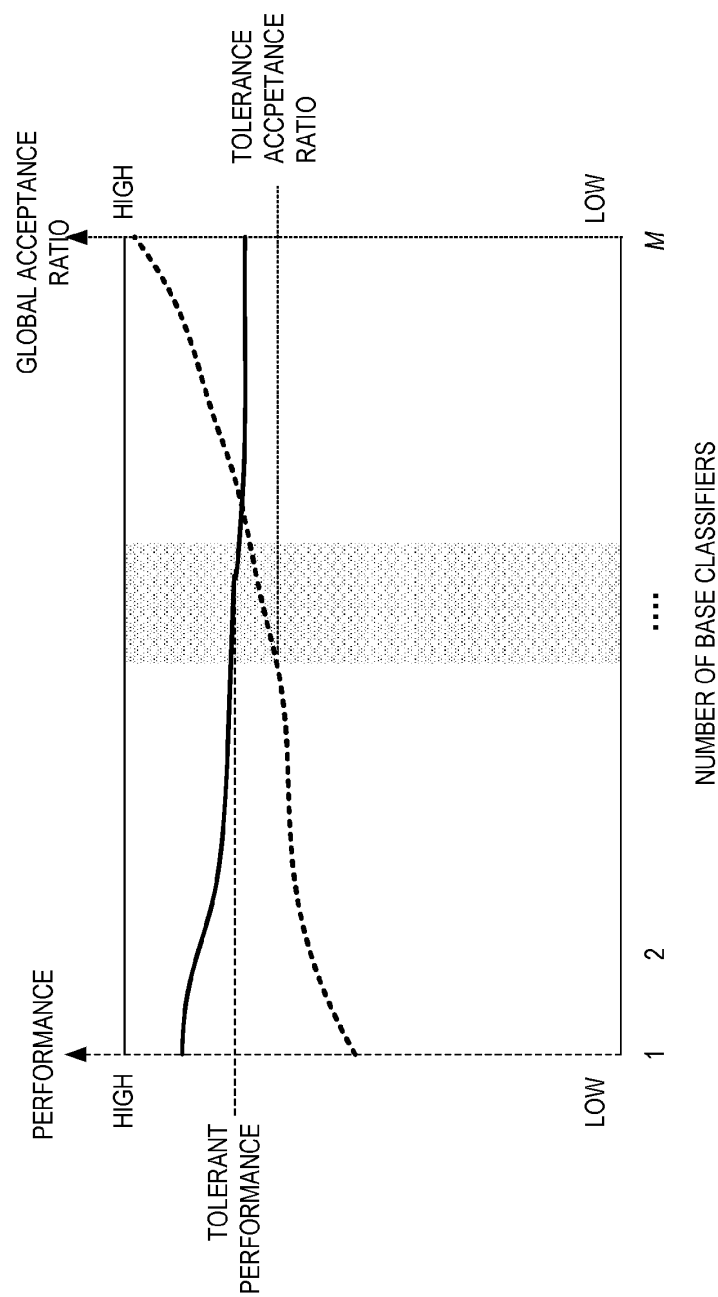


FIG. 10

DESCRIPTION OF THE EXPERIMENT DATASETS

DATASET	SOURCE	SAMPLES (FEATURES)	MIN. RATIO	CLASSES
PAYMENT RISK	OPENML	28,000 (29)	0.002	NORMAL; FRAUD
WATER QUALITY	UCI	139,566 (11)	0.012	GOOD; BAD
MAMMOGRAPHY	OPENML	11,183 (6)	0.023	NEGATIVE; POSITIVE
NETWORK ATTACK	UCI	93,124 (41)	0.057	NORMAL; ATTACK
HYPOTHYROID	OPENML	3,772 (7)	0.061	NEGATIVE; POSITIVE
VOWEL	OPENML	9,861 (12)	0.087	PLAYER 1; OTHERS
ACTIVITY MONITOR	UCI	10,299 (11 PCA)	0.185	STANDING; OTHERS
CREDIT DEFAULT	UCI	30,000 (23)	0.221	GOOD; DEFAULT
ADULT INCOME	OPENML	32,561 (14)	0.241	LOW; HIGH
LAND COVER	OPENML	581,012 (54)	0.365	SPRUCE; OTHERS
BREAST CANCER	OPENML	569 (30)	0.373	NEGATIVE; POSITIVE
MNIST	OPENML	42,000 (42 PCA)	0.490	ODD; EVEN

FIG. 11

PERFORMANCE OF DIFFERENT MODELS ON THE CLASS-IMBALANCED DATASETS							
MODEL	PAYMENT RISK	WATER QUALITY	MAMMOGRAPHY	NETWORK ATTACK	HYPOTHYROID	VOWEL	
PROPOSED: ACP	0.36 (0.02)	13.01 (0.01)	<0.01 (0.00)	0.05 (0.01)	<0.01 (0.00)	0.01 (0.00)	
PROPOSED: ALL	0.37 (0.02)	13.01 (0.01)	<0.01 (0.00)	0.06 (0.01)	<0.01 (0.00)	0.01 (0.00)	
DES KNN	1.53 (0.10)	0.78 (0.04)	0.16 (0.01)	0.80 (0.08)	0.08 (0.01)	0.25 (0.02)	
KNOP	1.44 (0.07)	0.76 (0.01)	0.17 (0.01)	0.74 (0.11)	0.08 (0.01)	0.20 (0.01)	
DESP	1.46 (0.11)	0.76 (0.01)	0.15 (0.01)	0.68 (0.06)	0.07 (0.01)	0.19 (0.01)	
DESMI	1.44 (0.06)	0.77 (0.01)	0.15 (0.01)	0.68 (0.05)	0.06 (0.01)	0.19 (0.01)	
KNORA-U	1.45 (0.09)	0.75 (0.01)	0.14 (0.00)	0.68 (0.06)	0.06 (0.01)	0.19 (0.01)	
KNORA-E	1.45 (0.05)	0.76 (0.01)	0.15 (0.01)	0.70 (0.10)	0.07 (0.01)	0.20 (0.02)	
META-DES	1.51 (0.13)	0.77 (0.01)	0.16 (0.01)	0.71 (0.04)	0.08 (0.00)	0.23 (0.02)	
RRC	1.45 (0.06)	0.76 (0.01)	0.15 (0.01)	0.69 (0.08)	0.06 (0.02)	0.19 (0.01)	
PROPOSED: ACP	86.71 (0.48)	97.14 (0.24)	74.43 (1.56)	99.07 (0.04)	89.50 (1.04)	95.93 (0.60)	
PROPOSED: ALL	86.06 (0.49)	97.13 (0.24)	68.14 (1.53)	97.19 (0.03)	89.39 (1.05)	94.65 (1.18)	
DES KNN	82.65 (1.97)	96.08 (0.37)	66.24 (1.81)	96.92 (0.26)	82.61 (2.01)	95.29 (0.96)	
KNOP	84.85 (0.64)	96.03 (0.93)	67.85 (1.12)	97.08 (0.14)	82.47 (0.97)	94.42 (0.62)	
DESP	84.20 (1.33)	96.26 (0.17)	68.19 (1.43)	97.08 (0.17)	84.26 (1.55)	95.26 (0.55)	
DESMI	84.17 (1.23)	96.40 (0.20)	67.69 (1.09)	94.37 (0.84)	81.86 (1.46)	94.42 (0.62)	
KNORA-U	84.36 (0.93)	96.27 (0.28)	68.07 (1.15)	97.11 (0.13)	83.60 (0.89)	95.34 (0.51)	
KNORA-E	83.15 (1.99)	96.29 (0.26)	67.85 (1.53)	96.87 (0.33)	82.98 (1.17)	95.37 (0.54)	
META-DES	85.11 (0.70)	94.97 (1.30)	67.72 (1.21)	97.05 (0.12)	77.05 (4.00)	92.45 (1.66)	
RRC	83.86 (1.50)	96.21 (0.34)	67.61 (1.40)	97.07 (0.19)	82.90 (1.75)	95.44 (0.68)	
PROPOSED: ACP	88.25 (0.36)	96.55 (0.06)	72.83 (1.57)	96.98 (0.05)	84.49 (1.31)	89.67 (0.74)	
PROPOSED: ALL	88.20 (0.36)	96.38 (0.06)	66.00 (1.17)	91.59 (0.11)	84.32 (1.27)	88.00 (0.81)	
DES KNN	83.65 (1.68)	94.41 (1.19)	64.63 (0.82)	92.09 (0.41)	82.39 (0.97)	89.12 (1.60)	
KNOP	85.54 (0.78)	94.78 (0.45)	65.91 (0.97)	92.13 (0.36)	82.31 (1.03)	87.34 (1.51)	
DESP	86.09 (1.13)	94.87 (0.45)	66.77 (0.85)	92.18 (0.37)	82.83 (1.20)	88.67 (1.20)	
DESMI	84.72 (0.75)	95.54 (0.39)	66.69 (1.08)	90.16 (0.53)	82.14 (1.06)	87.84 (1.45)	
KNORA-U	85.86 (1.24)	95.71 (0.46)	65.76 (1.02)	92.10 (0.32)	82.56 (0.93)	89.34 (1.10)	
KNORA-E	84.41 (0.81)	94.71 (0.46)	65.86 (1.53)	92.32 (0.43)	81.35 (0.81)	89.25 (1.38)	
META-DES	85.04 (0.50)	95.36 (0.56)	66.18 (0.99)	91.92 (0.34)	81.78 (1.20)	87.72 (1.44)	
RRC	84.34 (0.69)	94.80 (0.50)	65.84 (0.85)	92.24 (0.39)	82.85 (0.96)	88.99 (1.41)	
REJ. RATIO	<0.01	<0.01	0.03	0.04	<0.01	0.02	
REJ. PR-AUC [%]	9.42 (13.2)	N/A	28.85 (5.44)	68.30 (1.28)	N/A	31.34 (6.33)	

FIG. 12

PERFORMANCE OF DIFFERENT MODELS ON THE CLASS-IMBALANCED DATASETS												
	MODEL	ACTIVITY	MONITOR	CREDIT	DEFAULT	ADULT	INCOME	LAND	COVER	BREAST	CANCER	MNIST
INFERENCE TIME [SEC]	PROPOSED: ACP		<0.01 (0.00)		0.06 (0.01)		0.03 (0.00)		1.28 (0.05)		<0.01 (0.00)	
	PROPOSED: ALL		<0.01 (0.00)		0.06 (0.01)		0.03 (0.05)		1.29 (0.05)		<0.01 (0.00)	
	DES KNN		0.25 (0.03)		0.46 (0.05)		0.60 (0.03)		72.06 (3.23)		0.05 (0.01)	
	KNOP		0.15 (0.01)		0.33 (0.02)		0.38 (0.03)		60.55 (3.80)		0.05 (0.00)	
	DESP		0.14 (0.01)		0.32 (0.03)		0.40 (0.04)		61.50 (3.48)		0.04 (0.01)	
	DESMI		0.13 (0.01)		0.32 (0.03)		0.35 (0.03)		61.50 (3.48)		0.04 (0.00)	
	KNORA-U		0.14 (0.01)		0.32 (0.02)		0.36 (0.03)		57.63 (3.36)		0.04 (0.00)	
	KNORA-E		0.14 (0.02)		0.31 (0.02)		0.35 (0.03)		62.98 (2.70)		0.04 (0.01)	
	META-DES		0.16 (0.02)		0.35 (0.02)		0.40 (0.03)		62.33 (3.06)		0.05 (0.01)	
	RRC		0.17 (0.01)		0.30 (0.02)		0.36 (0.02)		63.88 (3.37)		0.04 (0.00)	
AUC [%]	PROPOSED: ACP		98.08 (0.04)		78.03 (0.04)		92.44 (0.04)		94.07 (0.01)		98.45 (0.21)	
	PROPOSED: ALL		97.73 (0.05)		78.02 (0.04)		92.02 (0.04)		92.52 (0.01)		98.45 (0.21)	
	DES KNN		97.79 (0.08)		77.25 (0.06)		91.42 (0.05)		92.51 (0.33)		97.94 (0.36)	
	KNOP		97.80 (0.07)		77.24 (0.05)		91.52 (0.04)		91.50 (0.31)		97.48 (0.68)	
	DESP		97.82 (0.05)		77.28 (0.05)		91.42 (0.05)		92.38 (0.34)		96.86 (0.73)	
	DESMI		97.75 (0.20)		77.18 (0.10)		91.01 (0.07)		90.56 (0.45)		96.86 (0.73)	
	KNORA-U		97.84 (0.04)		77.22 (0.05)		91.44 (0.04)		92.34 (0.33)		96.42 (1.14)	
	KNORA-E		97.73 (0.10)		77.26 (0.05)		91.44 (0.05)		92.61 (0.34)		96.42 (1.14)	
	META-DES		97.78 (0.04)		77.27 (0.05)		91.40 (0.05)		92.32 (0.34)		98.08 (0.46)	
	RRC		97.66 (0.07)		77.26 (0.05)		91.42 (0.04)		92.29 (0.33)		96.68 (0.37)	
ACCURACY [%]	PROPOSED: ACP		93.98 (0.08)		81.78 (0.04)		87.45 (0.06)		88.22 (0.01)		93.88 (0.72)	
	PROPOSED: ALL		93.29 (0.13)		81.78 (0.04)		86.89 (0.06)		85.17 (0.01)		93.88 (0.72)	
	DES KNN		93.38 (0.22)		81.77 (0.11)		86.06 (0.07)		87.81 (0.35)		93.67 (0.47)	
	KNOP		93.40 (0.12)		81.77 (0.08)		86.18 (0.10)		84.62 (0.32)		93.35 (0.38)	
	DESP		93.55 (0.14)		81.89 (0.11)		86.05 (0.07)		87.67 (0.34)		94.20 (0.39)	
	DESMI		93.56 (0.15)		81.73 (0.14)		85.32 (0.018)		83.50 (0.45)		92.23 (0.51)	
	KNORA-U		93.56 (0.15)		81.76 (0.06)		86.07 (0.07)		87.81 (0.34)		93.56 (0.39)	
	KNORA-E		93.32 (0.20)		81.83 (0.08)		86.12 (0.08)		88.20 (0.35)		94.36 (0.62)	
	META-DES		93.41 (0.18)		81.81 (0.11)		85.98 (0.07)		87.73 (0.35)		93.88 (0.28)	
	RRC		93.13 (0.20)		81.81 (0.09)		86.01 (0.06)		87.43 (0.34)		93.56 (0.17)	
REJ. RATIO	PROPOSED: ACP		0.02		0.00		0.02		<0.01		0.00	
REJ. PR-AUC [%]	BEST BASE		66.09 (2.34)		N/A		55.90 (2.46)		63.34 (6.51)		N/A	
												<0.01
												61.79 (0.01)

FIG. 13

PERFORMANCE WITH DIFFERENT NUMBER OF BASE MODELS (PAYMENT RISK DATA)				
# BASE	REJ. RATIO	TIME [SEC]	PR-AUC [%]	F1 SCORE [%]
1	0.105	0.31 (0.06)	90.63 (0.65)	92.97 (0.48)
2	0.053	0.32 (0.03)	88.77 (0.50)	91.88 (0.21)
3	0.013	0.35 (0.03)	87.51 (0.30)	90.24 (0.26)
4	0.409	0.36 (0.03)	87.16 (0.18)	90.05 (0.36)
5	0.009	0.36 (0.02)	87.00 (0.23)	89.64 (0.52)
6	0.601	0.36 (0.02)	86.71 (0.48)	88.25 (0.36)
BEST DES	N/A	1.44 (0.06)	85.11 (0.70)	86.09 (1.13)

FIG. 14

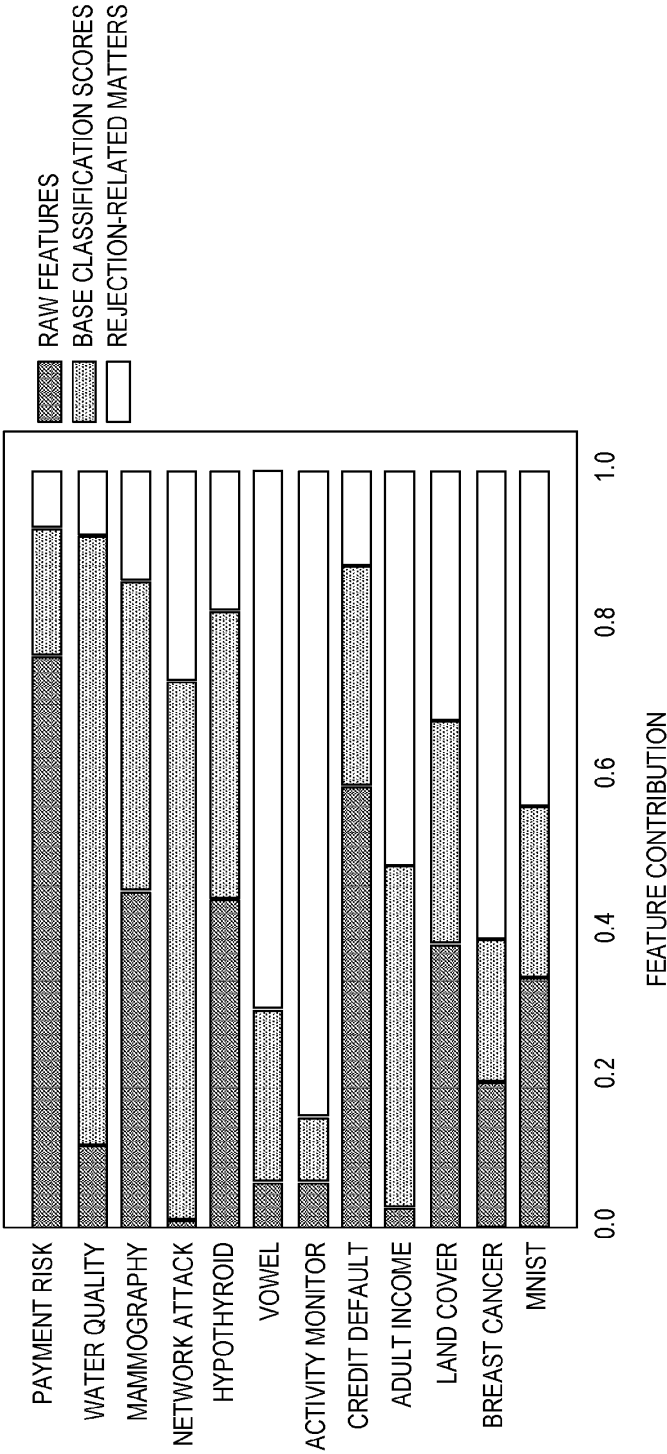


FIG. 15