Fixed size and Fixed brand

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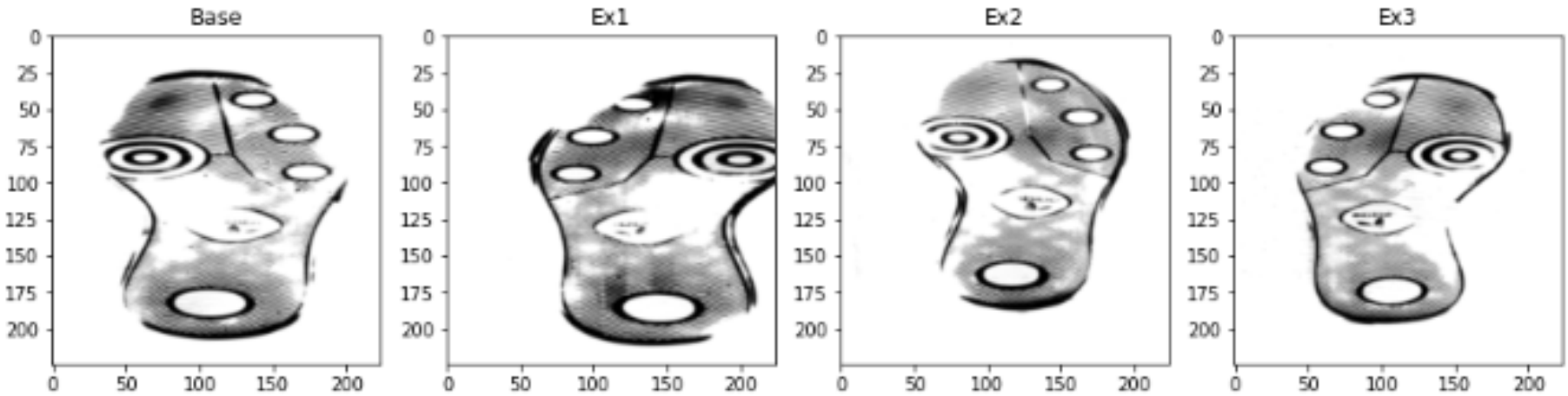
Process

1) Fix size and brand (7, Adidas)
2) Aligning all images into one base image (KAZE descriptor)
3) Calculate norm of vectors(CP-decomposition, descriptors)
4) Classification(Optimal point, RandomForest)
5) Find significant point

Data

Original



Data

Alignment

Data

- Total 2696 pairs
- 1348 matching pairs vs 1348 non-matching pairs
- Train : Test = 1897 : 899 (Random forest)
- Train : Validation : Test = 898 : 899 : 899 (Optimal point method)

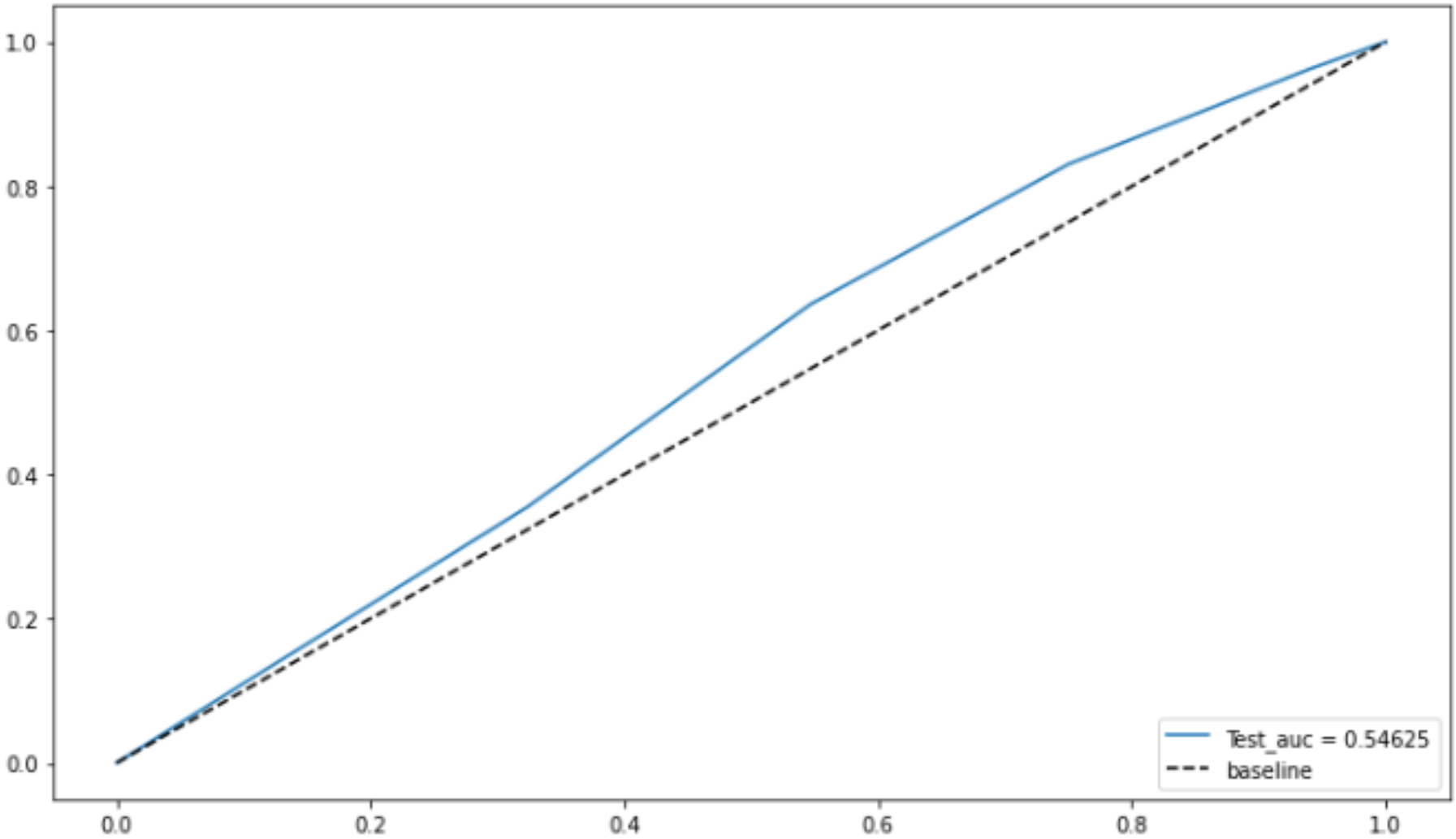
Data

Norm dataset

SIFT_Feature	BRISK_Location	BRISK_Feature	FAST_Location	FAST_Feature	Harris_Location	Harris_Feature	ORB_Location	ORB_Feature	CP_norm	Match
4215.710	272.2873	676.744095	6.0000	497.991244	194.6727	543.227380	208.0910	496.963104	0.061916	0
5298.007	291.0800	635.508939	351.6321	669.390558	192.5466	691.812336	417.1071	571.851750	0.090059	0
4481.149	314.9523	686.727253	212.6612	691.097230	276.9988	677.015198	359.0557	533.281743	0.077594	0
5399.165	401.5584	750.170378	116.6861	662.666398	104.0981	661.383038	154.4104	561.776234	0.085339	0
5332.201	299.7632	690.472448	111.6307	678.762706	280.5052	766.362031	184.2029	560.871608	0.084963	0
...	...	...	...	...	...	...	...	...	...	...
8764.519	384.4167	856.378509	314.4477	775.528052	184.6340	714.670349	130.9814	610.906340	0.103518	1
7789.936	480.4718	803.761220	278.6728	729.299835	182.0493	789.915842	376.4511	603.766251	0.113162	1
6532.259	178.1028	564.800527	186.6725	662.907892	154.6824	642.661081	119.3740	528.295030	0.106464	1
12540.590	268.0300	769.368273	517.4013	808.776195	531.4758	796.250021	672.2609	591.147965	0.232447	1
7366.222	278.8738	775.857884	149.4181	686.520988	195.7692	770.254073	358.6446	614.381592	0.086701	1

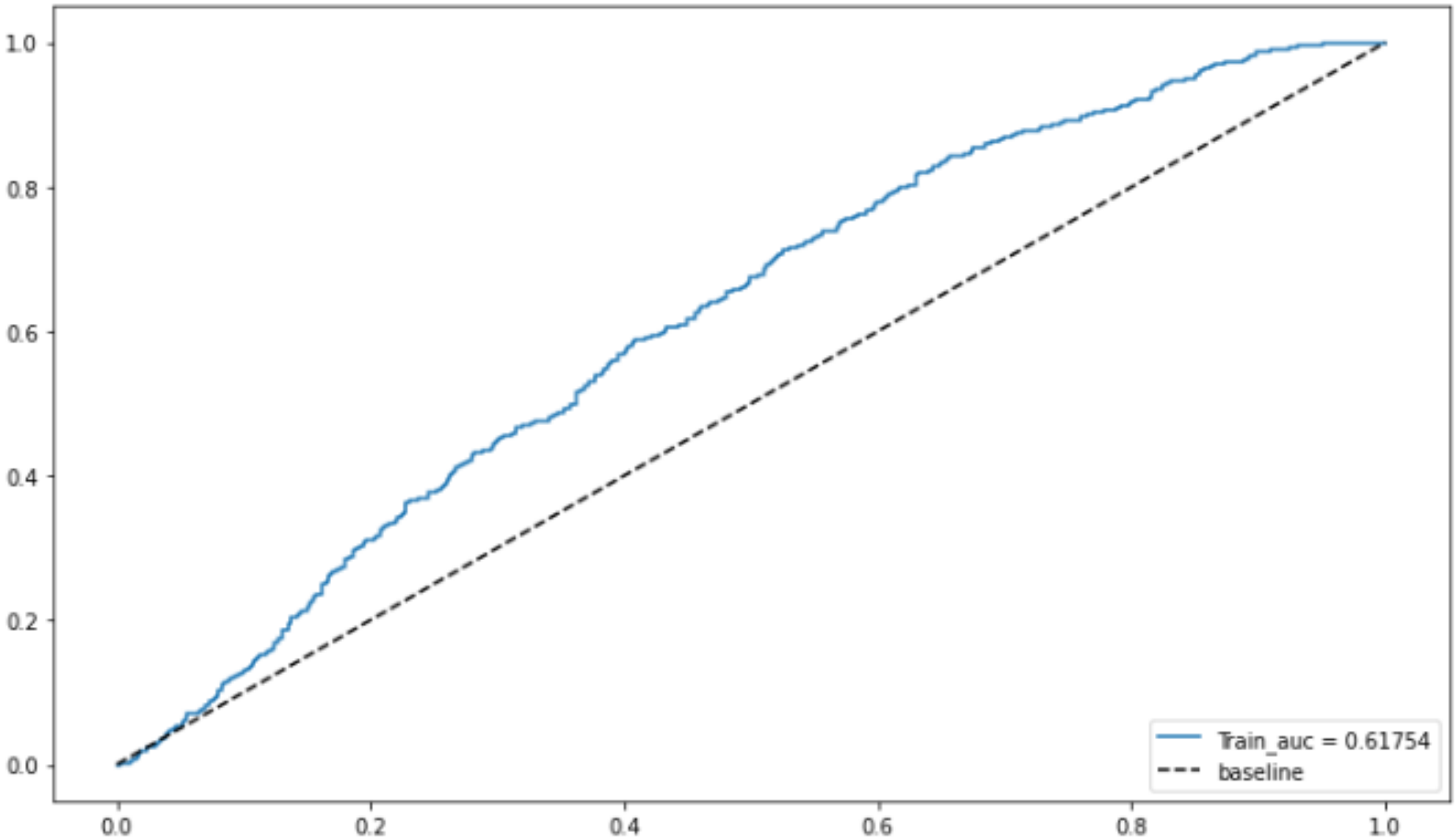
Modeling

Random forest with descriptors



Modeling

Optimal point



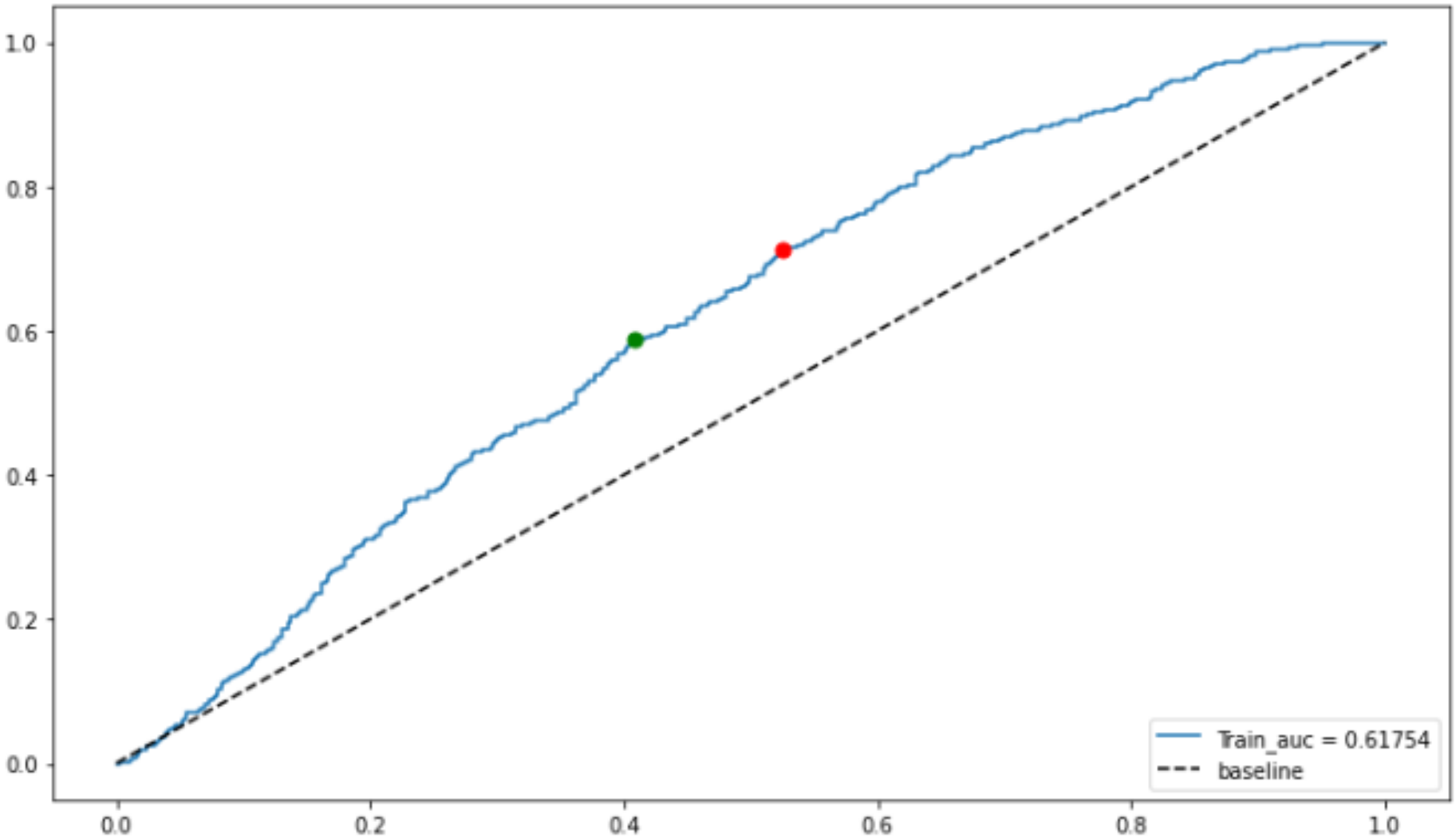
Modeling

Optimal point

1. $max(TPR - FPR)$: Red color
2. $TPR + FPR \simeq 1$: Green color

Modeling

Optimal point



Modeling

Optimal point

Validation	Accuracy	Recall	Specificity
Method1	0.598	0.521	**0.675**
Method2	**0.602**	**0.659**	0.546

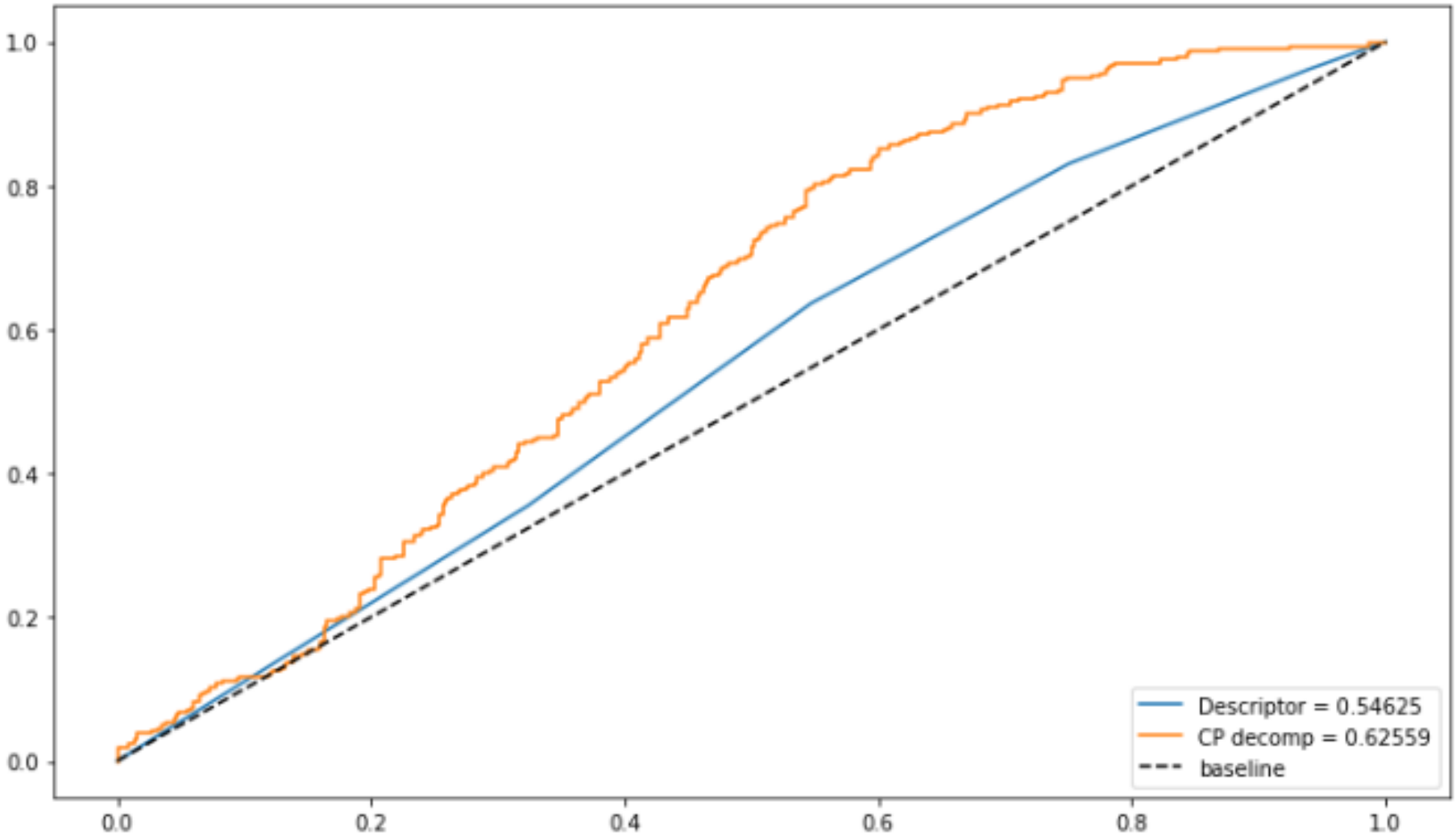
Modeling

Optimal point

Test	Accuracy	Recall	Specificity
Method2	0.581	0.583	0.546

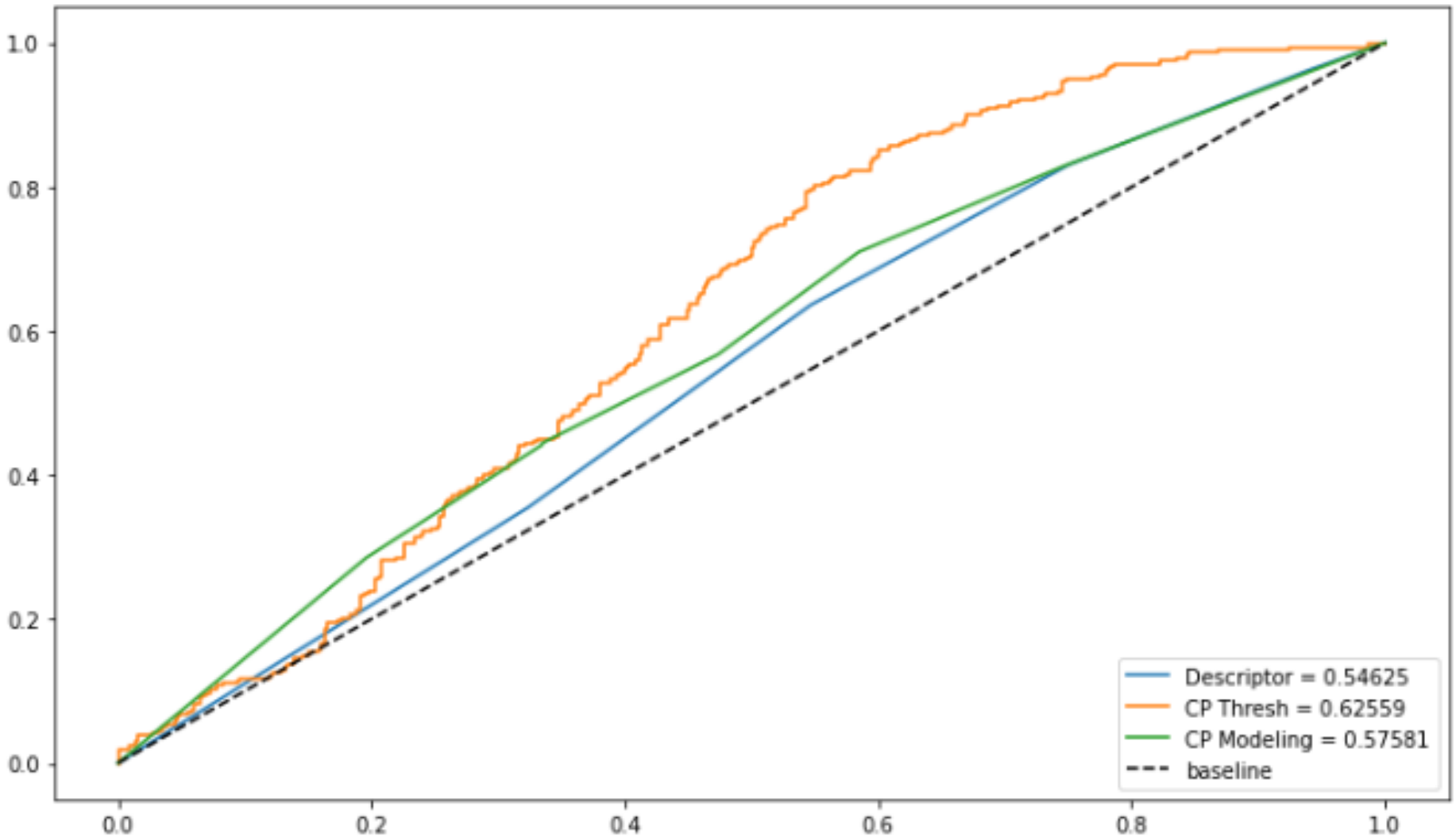
Modeling

Optimal point



Modeling

Random forest with CP norm

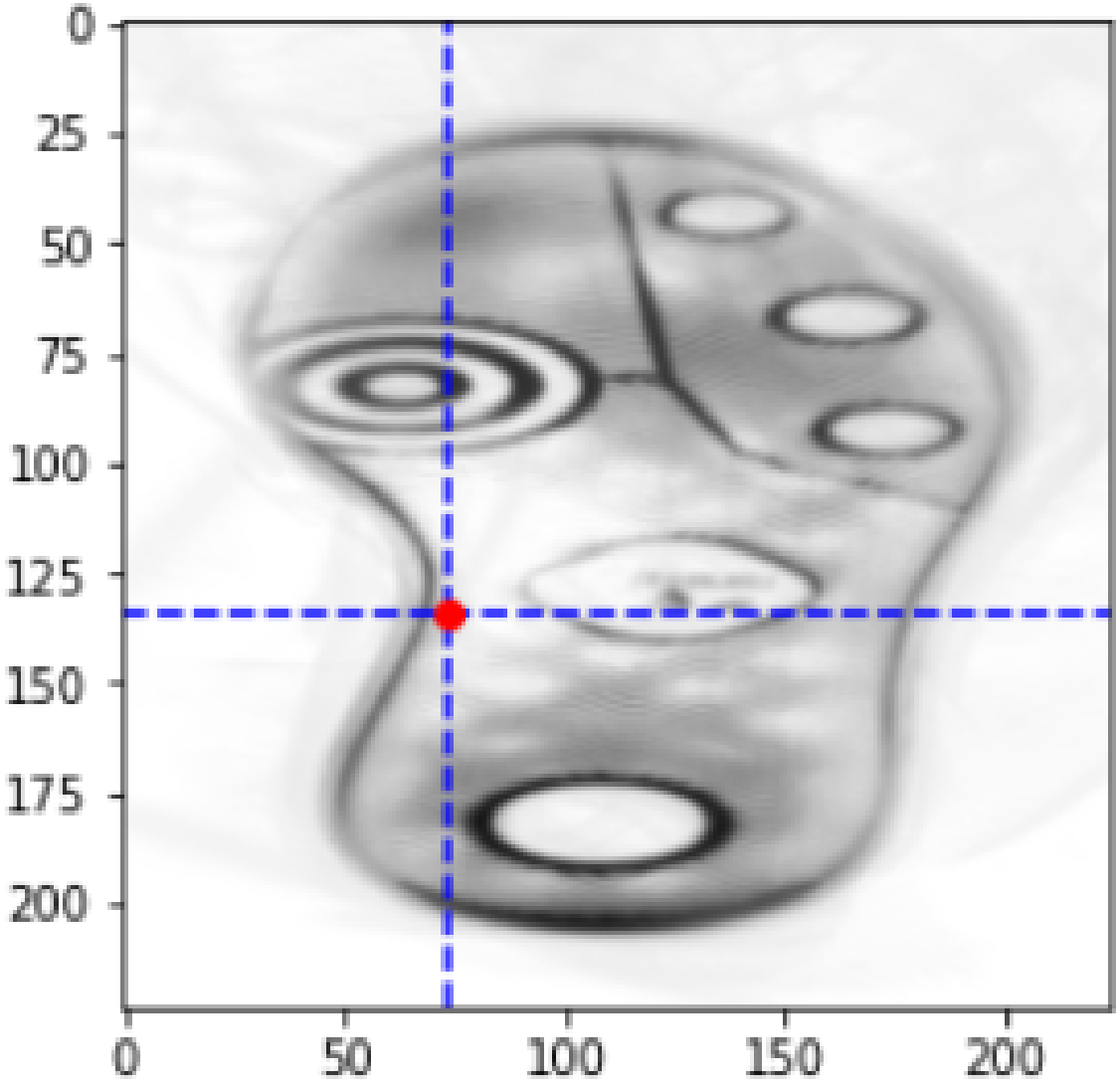


Significant point

- Find the smallest value point in mean of CP-decomposed vector
- Draw average image of aligning images
- Add significant component x-axis and y-axis
- Significant point = cross point of components

Significant point

Average image



Summary

Change the alignment way

Original : align the same person, size and brand images

New way : align size and brand images

→ Increase classification error

Find significant point

- Have to align as the new way to define baseline image
- Just find the smallest value point
  - Does not mean the difference to classify matching and non-matching

→ Find a new way to figure out important point in classification