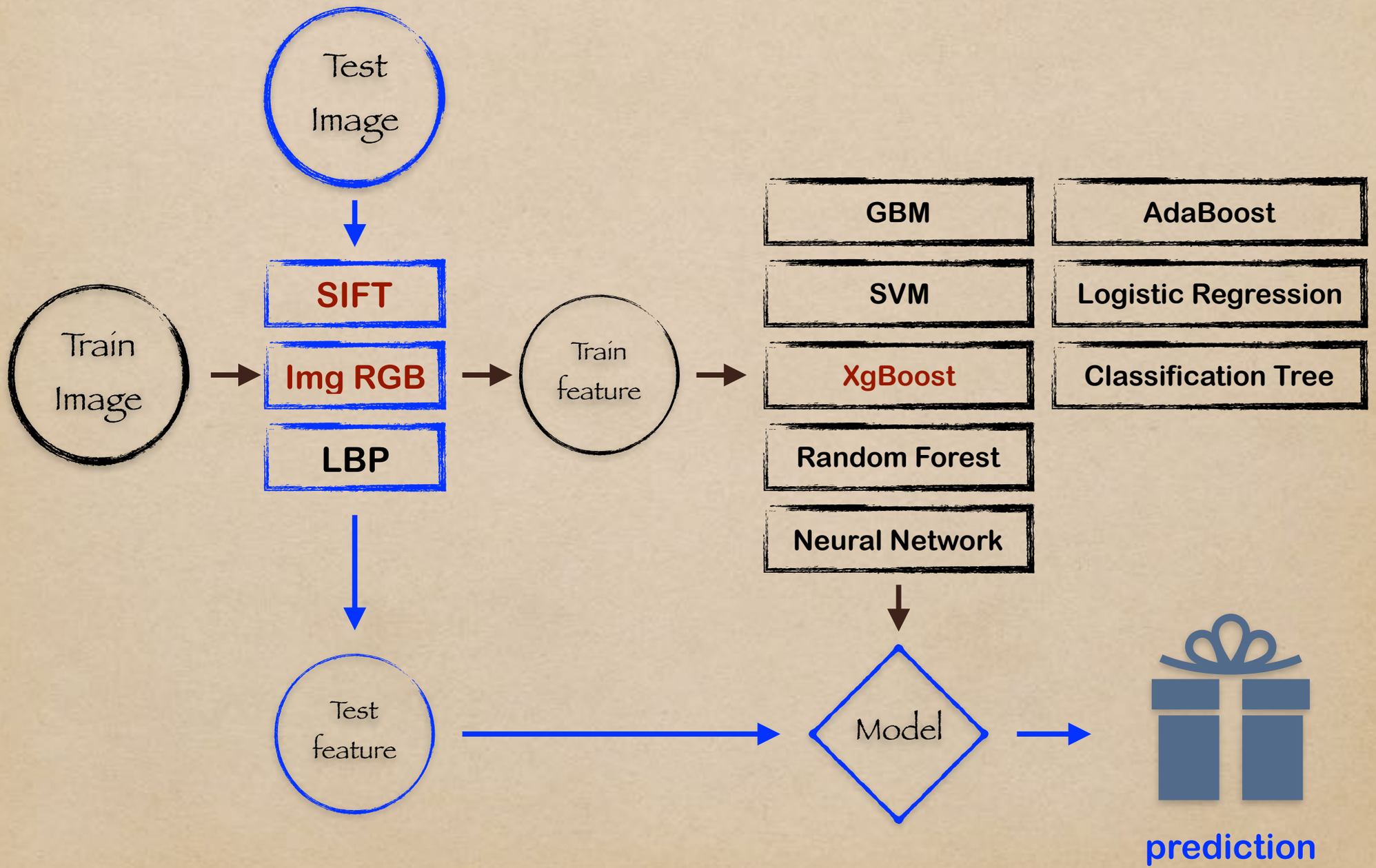
Project3-Group3

Dogs, Fried Chicken, or Blueberry Muffins?

Keran Li, Mingming Liu, Zhongxing Xue, Yuhan Zha, Junkai Zhang

SIX Model



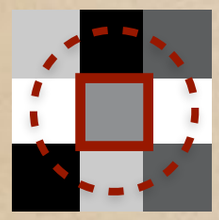
Dogs, Fried Chicken, or Blueberry Muffins?

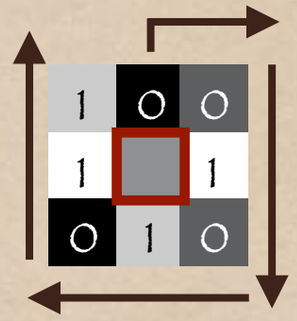
SIX Model

- Feature Selection — SIFT, LBP, Image RGB
- Classification Model
- Result

LBP Feature

(Local Binary Patterns)





$(00101011)_2$

LBP#43

Calculate frequency

■ < ▢ : 0

□ > ▢ : 1

- ✗ lack of color change
- ✗ Scale & spin Variance
- ✗ Huge time cost!

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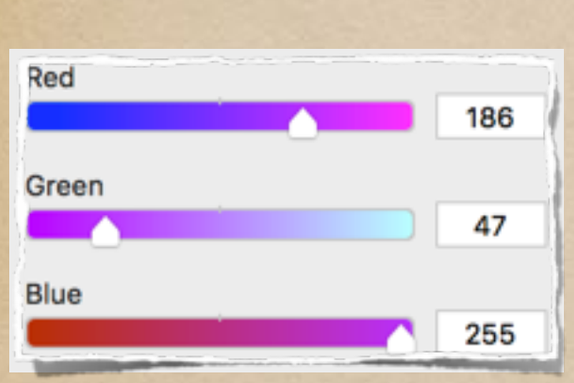
Image RGB Feature

RGB position → (186,47,255) → Subgroup → (9,3,12) → f(a,b,c) = 144(a-1) + 12(b-1)+c → Color#1188



Range	Subgrp
0-21	1
22-42	2
43-64	3
65-85	4
86-106	5
107-128	6
129-149	7
150-170	8
171-192	9
193-213	10
214-234	11
235-255	12

Calculate frequency of each number as a RGB feature.

Now we have 1728 new features:
Color#1 ~ Color#1728

- ✓ Time cost: 15~20 mins
- ✓ Huge increase of accuracy

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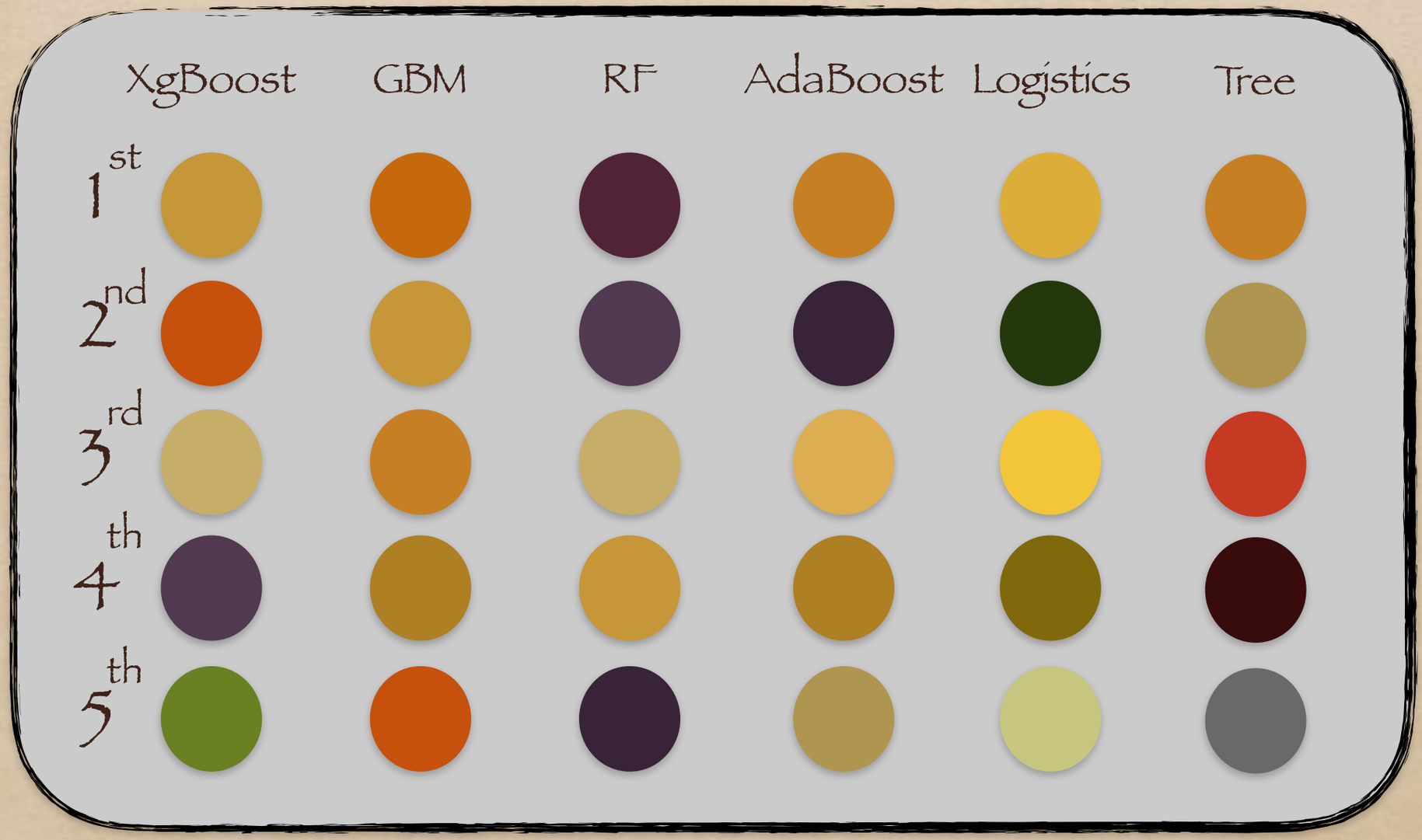
Image RGB Visualization

(With feature: only ImageRGB)



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SIX Model

- Feature Selection
- Classification Model — XgBoost
- Result

Classification Model

(Up to 2018.03.21)

91.06%

XgBoost

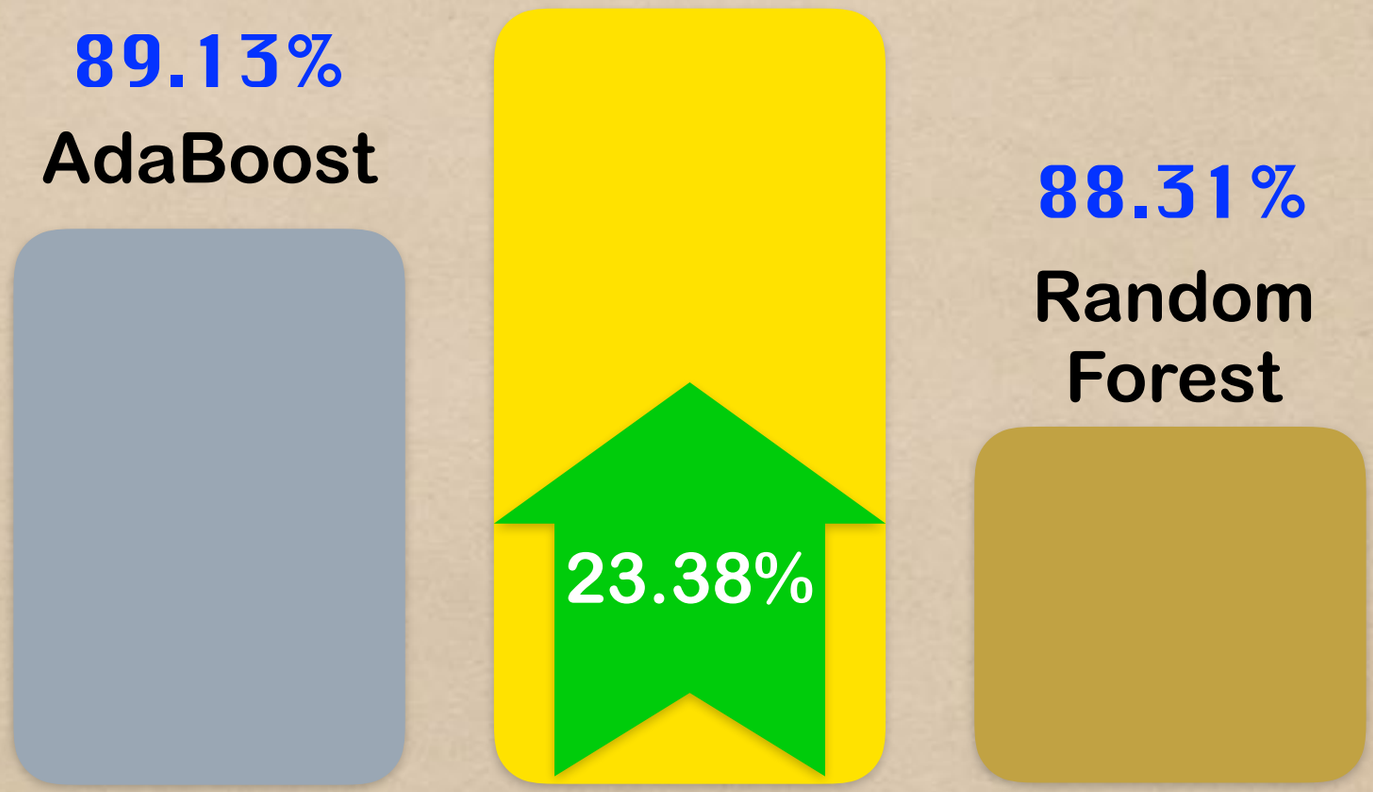
(With feature: SIFT+ImageRGB)

89.13%

AdaBoost

88.31%

Random Forest



GBM Base model

67.68%

(With feature: SIFT)

Dogs, Fried Chicken, or Blueberry Muffins?

SIX Model

- Feature Selection
- Classification Model
- Result

Accuracy(%) + Time(s)

(Up to 2018.03.21)

Features \ Algorithm	GBM	XgBoost	Adaboost	RF	Logistic	SVM	Tree	NN
S 2000d	67.68	70.35	65.17	64.64	68.34	71.66	53.77	72.74
S+I 2512d	83.75	88.69	85.57	86.09	79.45	83.36	78.02	49.37
S+I 3728d	86.24	91.06	89.13	88.31	82.80	83.77	79.50	48.83
I 1717d	84.30	90.65	87.48	87.21	71.11	74.97	71.11	30.12
S+I+L 3949d	86.73	87.40	86.46	84.85	79.62	54.96	79.62	58.44

Dogs, Fried Chicken, or Blueberry Muffins?

Accuracy(%) + Time(s)

(Up to 2018.03.21)

Features \ Algorithm	GBM	XgBoost	Adaboost	RF	Logistic	SVM	Tree	NN
S 2000d	67.68 178.34	70.35 375.78	65.17 5.96	64.64 188.09	68.34 55.54	71.66 43.11	53.77 2.23	72.74 >999
S+I 2512d	83.75 219.04	88.69 389.36	85.57 503.74	86.09 122.98	79.45 50.97	83.36 36.58	78.02 2.79	49.37 >999
S+I 3728d	86.24 313.56	91.06 440.56	89.13 721.95	88.31 190.51	82.80 146.64	83.77 61.21	79.50 5.64	48.83 >999
I 1717d	84.30 146.32	90.65 453.77	87.48 284.36	87.21 84.90	71.11 87.21	74.97 25.44	71.11 1.79	30.12 >999
S+I+L 3949d	86.73 333.12	87.40 463.39	86.46 932.91	84.85 227.16	79.62 153.2	54.96 27.16	79.62 3.83	58.44 687.00

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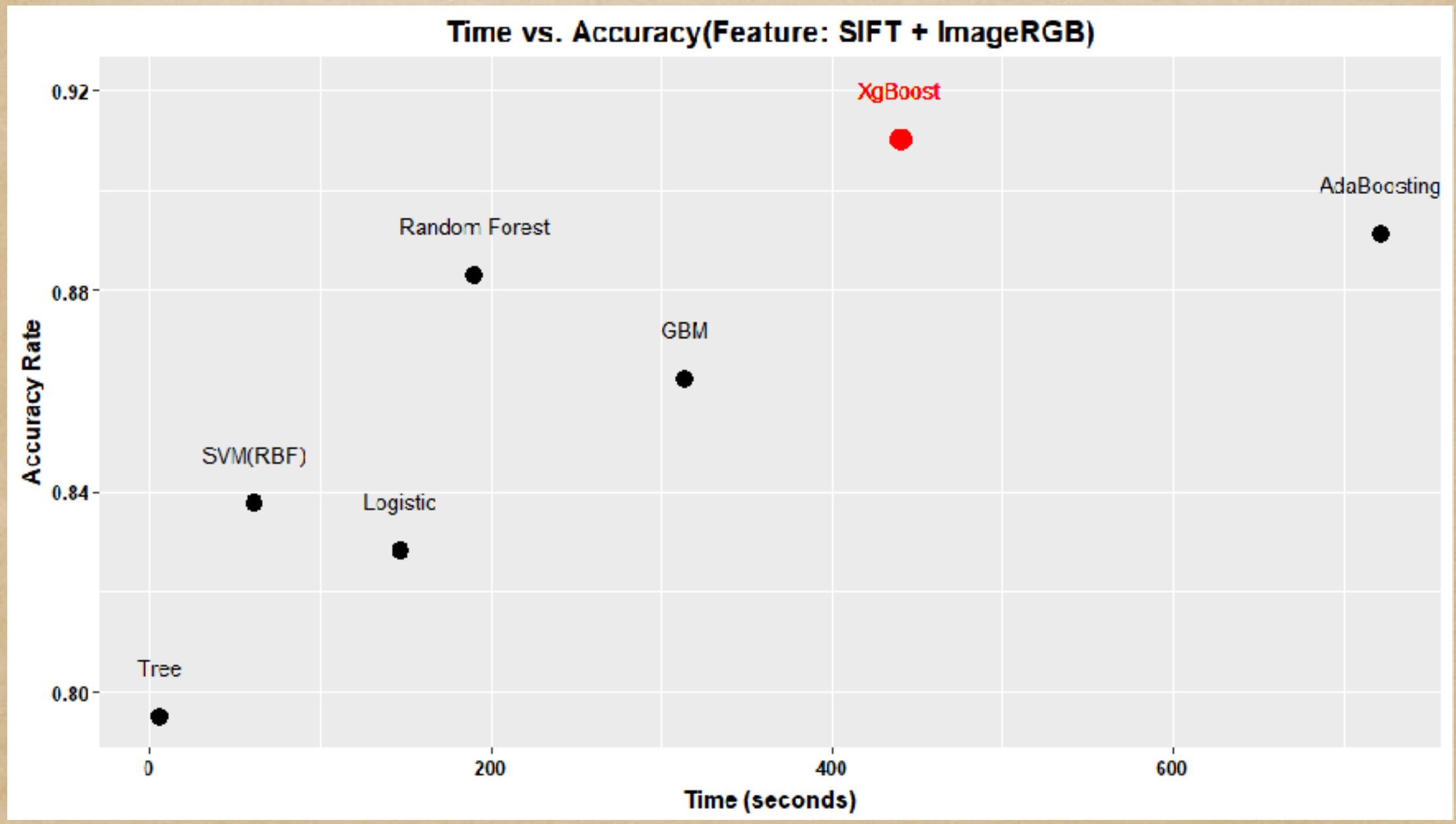
Result



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About train data

0784.jpg: Chicken, 0/8

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Keran Li: Neural Network, Logistic
Mingming Liu: AdaBoost, Random Forest
Zhongxing Xue: GBM
Yuhan Zha: SVM, Classification Tree
Junkai Zhang: XgBoost

ppt: Zhongxing Xue
presenter: Zhongxing Xue