AN ADVENTURE WITH POODLES AND CHICKEN

GROUP 2

PROJECT 3

APPLIED DATA SCIENCE

GAME GUIDANCE

- HOG
- SIFT

Feature Exaction

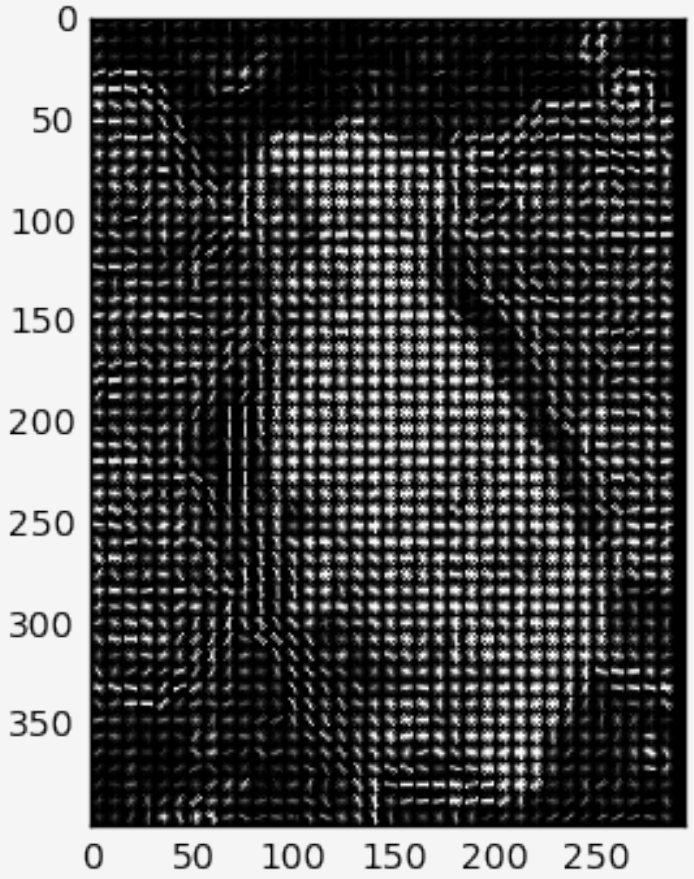
Feature Selection

•Bag of Words

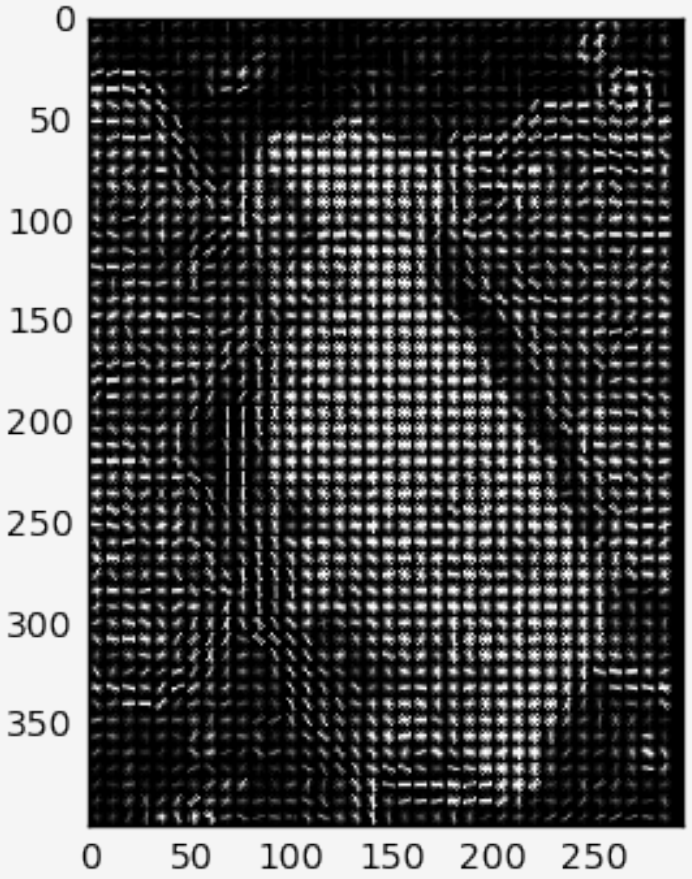
- SVM
- Bart
- GBM

Classifier

HUMAN LEARNING

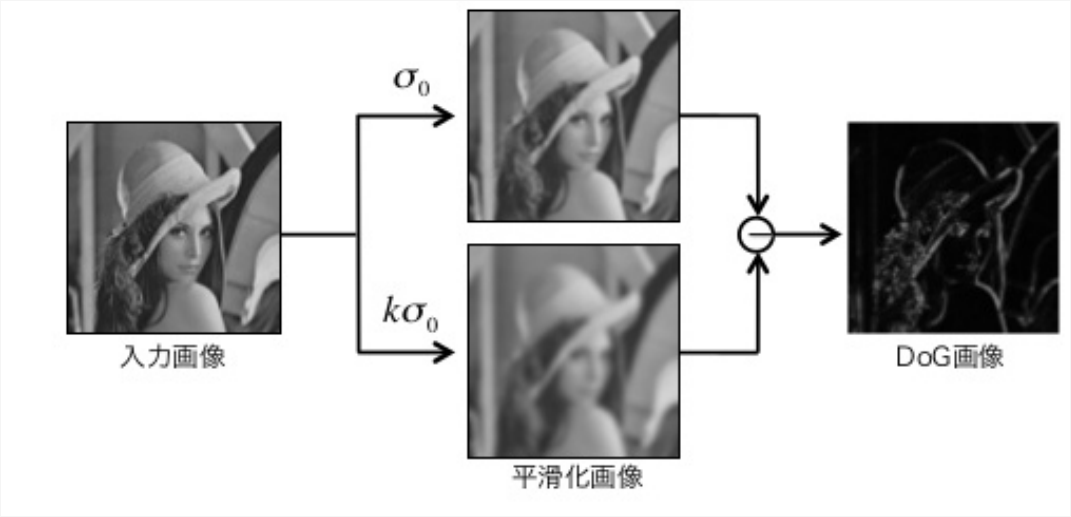


HUMAN LEARNING



SIFT

- Key points
- Local Features
- Rotation and Scale



HOG

- Whole image
- Global Features
- NO Rotation and Scale

BAG OF WORDS

CODEBOOK

- 500 KEY FEATURES
- EVALUATE EACH PICTURES

MODEL BIN

SVM

BAGGING

CNN

GBM

RANDOMFOREST

XGBOOST

LDA

PRELIMINARY MODEL SELECTION

Features & Model	GBM(with grid search)	Random Forest (tree = 200, ntry = 2000)	BartMachine (tree = 300)	SVM
SIFT	70.65%	71.40%	NA	74.85%
SIFT + BOW	85.70%	82.60%	86.71%	87.11%
SIFT + PCA	NA	70.05%	71.00%	73.25%
HOG	4NA	51.25%	52.11%	55%

- 5-folds
- 5 times
- Cross Validation

SELECTED MODEL SELECTION

FEATURE: SIFT + BOW	SVM(LINEAR)
Cost = 100	78.53%
Cost = 10	79.10%
Cost = 1	80.22%

FEATURE: SIFT + BOW	SVM(KERNEL)
Gamma = 0.01	76.92%
Gamma = 0.001	87.10%
Gamma = 0.0001	84.50%
Gamma = 10^{-5}	67.53%

- 5-folds
- 20 times
- Cross Validation

FINAL MODEL

FEATURE: SIFT + BOW	SVM(LINEAR)
Cost = 100	78.53%
Cost = 10	79.10%
Cost = 1	80.22%

FEATURE: SIFT + BOW	SVM(KERNEL)
Gamma = 0.01	76.92%
Gamma = 0.001	87.10%
Gamma = 0.0001	84.50%
Gamma = 10^{-5}	67.53%

GAME WALKTHROUGH

Raw Image

SIFT Extraction (around 1000 features)

Bag of Words Codebook Evaluation (500 features)

SVM (nonlinear, Gamma = 0.001)