



# **AN ADVENTURE WITH POODLES AND CHICKEN**

**GROUP 2**

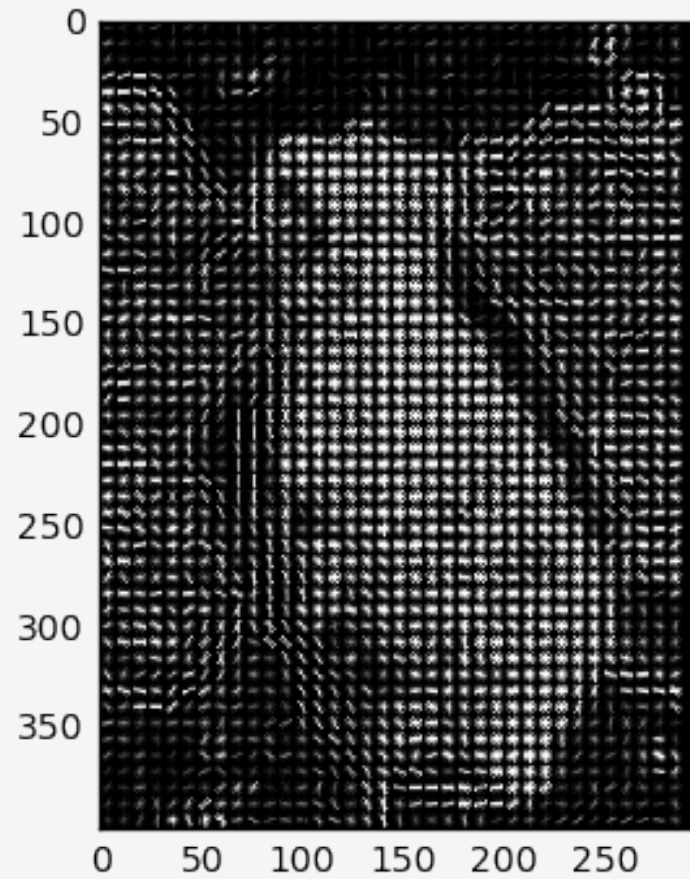
**PROJECT 3**

**APPLIED DATA SCIENCE**

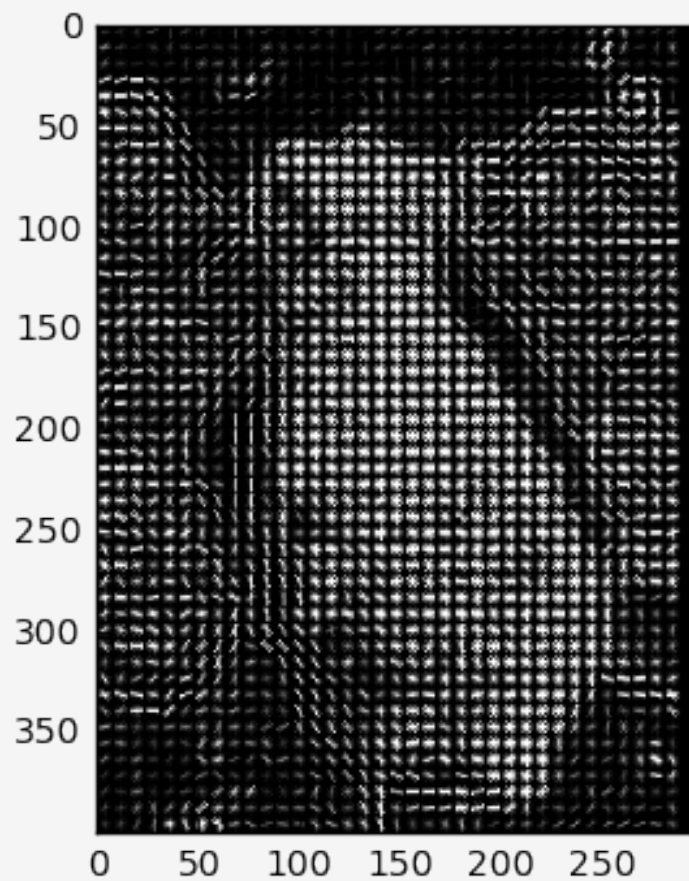
# GAME GUIDANCE



# HUMAN LEARNING

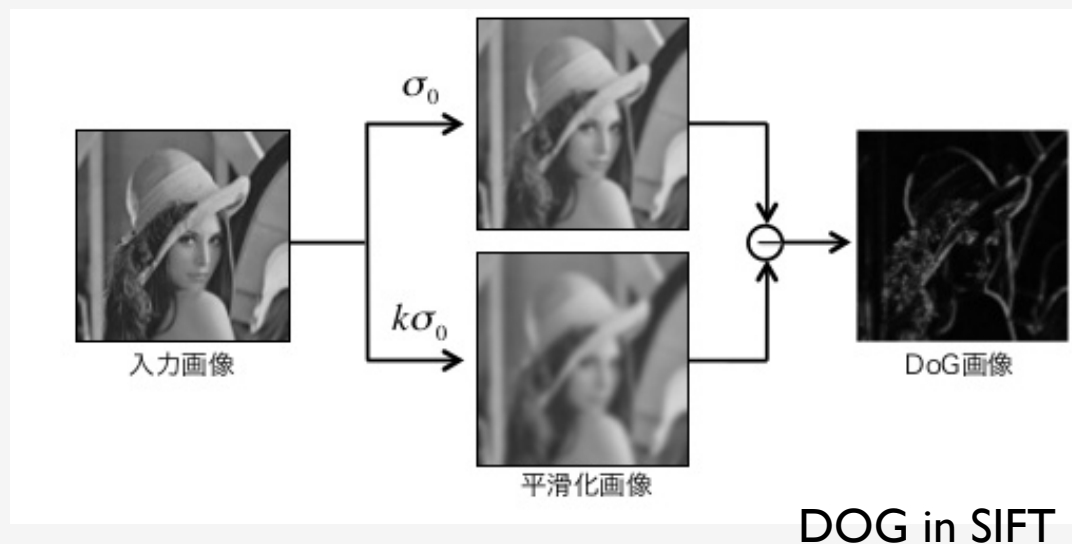


# HUMAN LEARNING



## 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

BARTMACHINE

RANDOMFOREST

XGBOOST

LDA

# PRELIMINARY MODEL SELECTION

Features & Model	GBM(with grid search)	Random Forest (tree = 200, ntry = 2000 )	BartMachine (tree = 300)	SVM (Nonlinear Gamma = 0.001 )
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	NA	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%

APPROVED

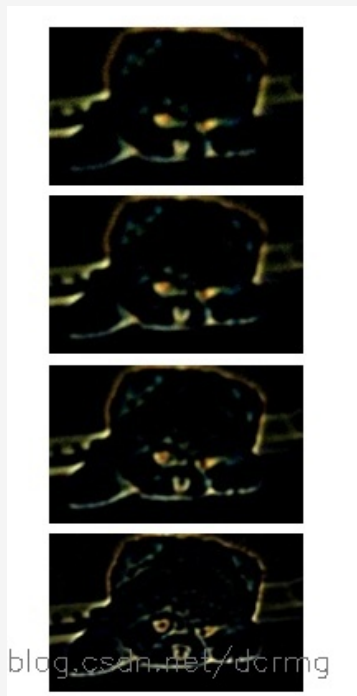
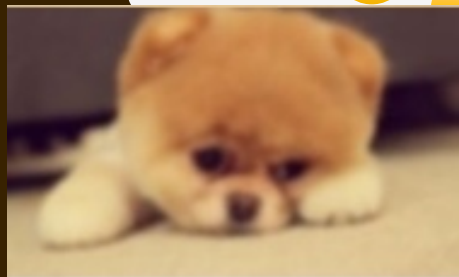
# GAME WALKTHROUGH

Raw Image

SIFT Extraction  
(around 1000  
features)

Bag of Words  
Codebook  
Evaluation (500  
features)

SVM  
(nonlinear,  
Gamma =  
0.001)



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