Introduction to Pattern Recognition
Homework 2 announcement

TA: 楊証琨 Jimmy

Ph.D. student at National Taiwan Universitiy

d08922002@csie.ntu.edu.tw

Homework 2

- **Deadline: April. 21, Fri at 23:59.**
  1. Code assigment (60%): Implementing Fisher's linear discriminat using numpy
  2. Short answer questions (40%)
- **Submit your code (.py/.ipynb) and reports (.pdf) on E3**
  - Sample Code
  - HW2 questions
- Please follow the **file naming rules <STUDENT ID>_HW2.pdf,** otherwise, you will get penalty of your scores

0856165_HW1.ipynb
0856165_HW1.pdf
Compress → 0856165_HW1.rar → submit → E3

Coding

- Write beautiful Python codes with PEP8 guidelines for readability. Basic requirement: use whitespace correctly!
- PEP8 online checker

```python
Python

# Recommended
def function(default_parameter=5):
    # ...



# Not recommended
def function(default_parameter = 5):
    # ...
```

PEP8 online

Check your code for PEP8 requirements

Just paste your code here

Check code

Reports

- Submit in PDF format
- Please include the answers of coding part
- See the sample submission file on E3

NCTU Pattern Recognition, Homework 1| Example

Part. 1, Coding (60%):

Q1: Your answer…
Q2: Your answer….
Q3: Your answer….
Q4: Your answer….
Q5: Your answer….

Part. 2, Questions (40%):

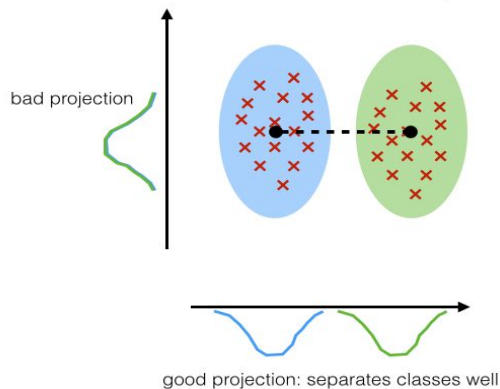Q1: Your answer…
Q2: Your answer…

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Fisher's linear discriminant

- FLD seeks the projection **w** that gives a large distance between the projected data means while giving a small variance within each class

LDA:
maximizing the component axes for class-separation

bad projection

good projection: separates classes well

$$J(\boldsymbol{W}) = \frac{(m_2 - m_1)^2}{s_1^2 + s_2^2}$$
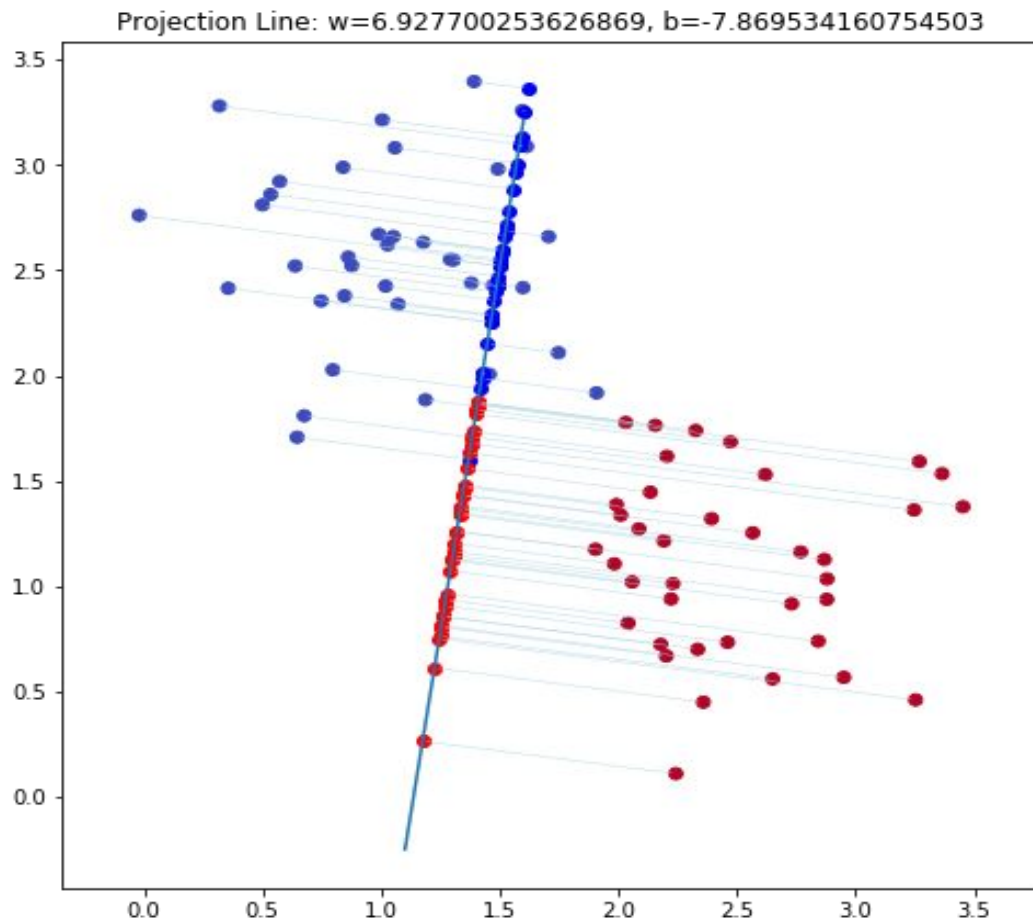
■ Between-class variance
■ Within-class variance

Question 6

1. Projection line
2. Colorize the data points
3. Project the data points onto projection line

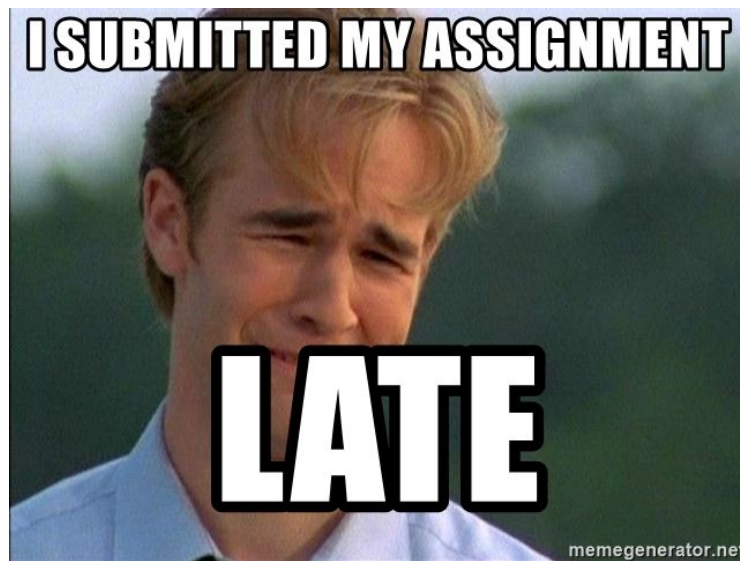Projection Line: w=6.927700253626869, b=-7.869534160754503

Supplementary materials

- [An illustrative introduction to Fisher's Linear Discriminant](#)

Late Policy

- We will deduct a late penalty of 20 points per additional late day
- For example, If you get 90 points of HW1 but delay for two days, your will get only 90- (20 x 2) = 50 points!

Notice

- Submit your homework on [E3-system](#) !
- Check your email regularly, we will mail you if there are any updates or problems of the homework
- If you have any questions or comments for the homework, please mail me and cc Prof. Lin
  - Prof. Lin, **lin@cs.nctu.edu.tw**
  - TA Jimmy, **d08922002@csie.ntu.edu.tw**
  - TA 柏聲, **bensonliu0904@gmail.com**
  - TA 玉霖, **oscar861201@gmail.com**

Have fun!

Lady tasting tea