



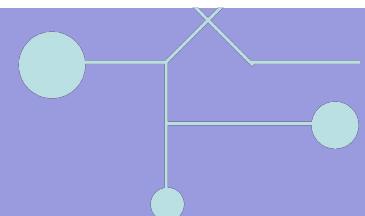
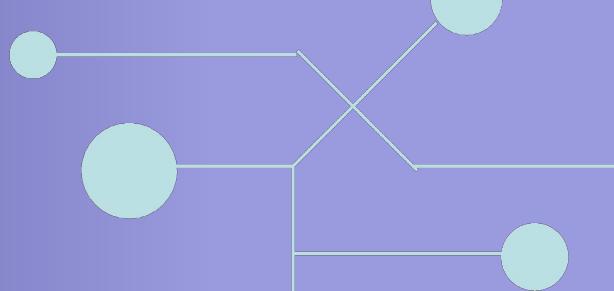
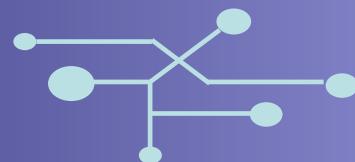
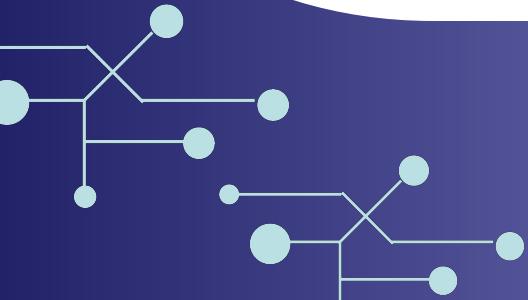
Introduction to Pattern Recognition

Homework 2 announcement

TA: 楊証琨 Jimmy

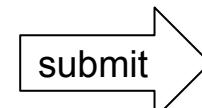
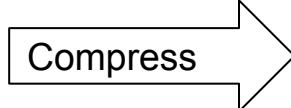
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Homework 2

- **Deadline: April. 21, Fri at 23:59.**
 1. Code assignment (60%): Implementing Fisher's linear discriminant 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



E3

Coding

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

```
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

The screenshot shows a web-based PEP8 code checker. At the top, there's a header with the text "PEP8 online" and "Check your code for PEP8 requirements". Below this is a text input area with the placeholder "Just paste your code here". In the input area, there is some sample Python code. At the bottom of the input area, there is a small number "1" followed by a cursor. At the very bottom of the page, there is a "Check code" button.



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...

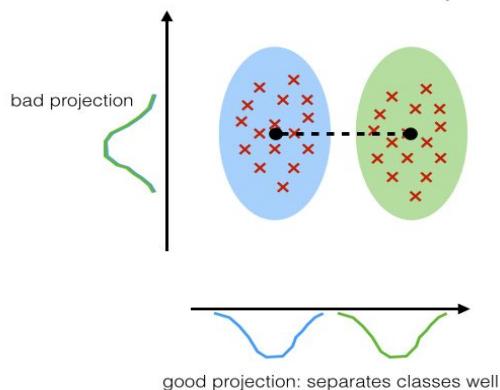


Fisher's linear discriminant

- FLD seeks the projection \mathbf{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



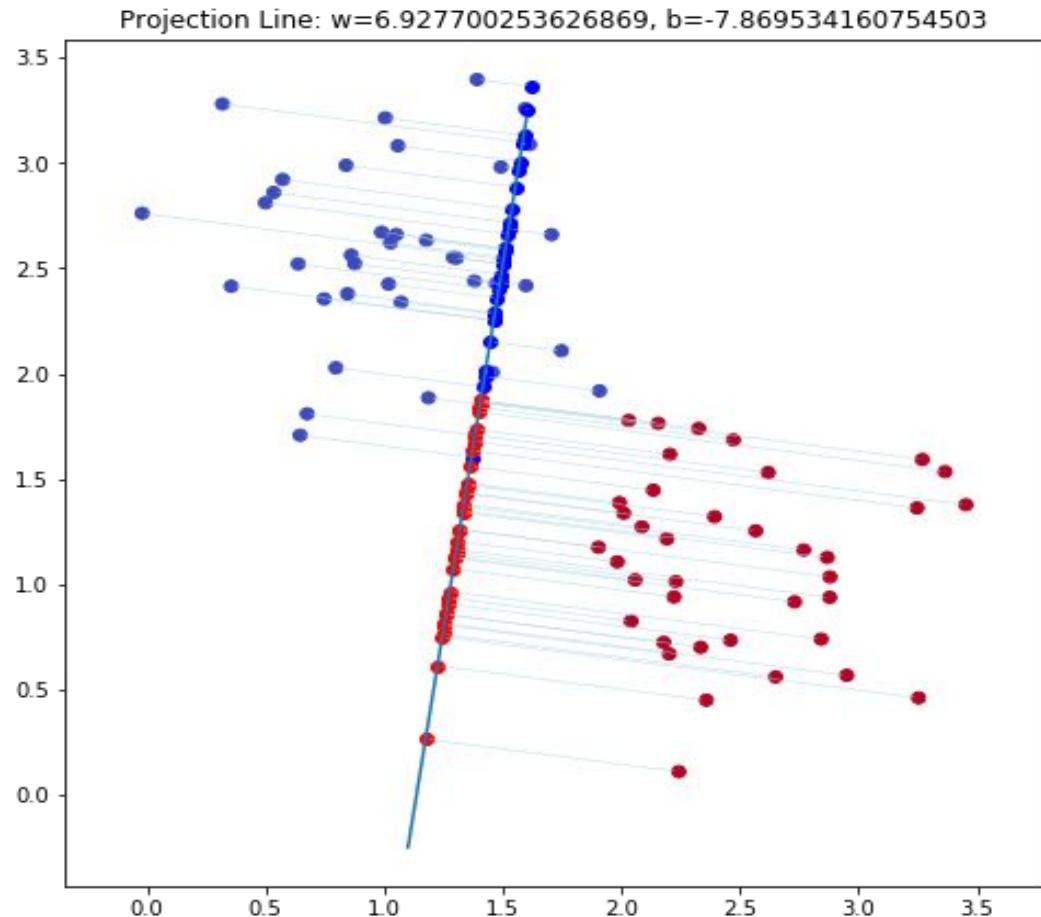
$$J(\mathbf{W}) = \frac{(m_2 - m_1)^2}{s_1^2 + s_2^2}$$

■ *Between-class variance*
■ *Within-class variance*



Question 6

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



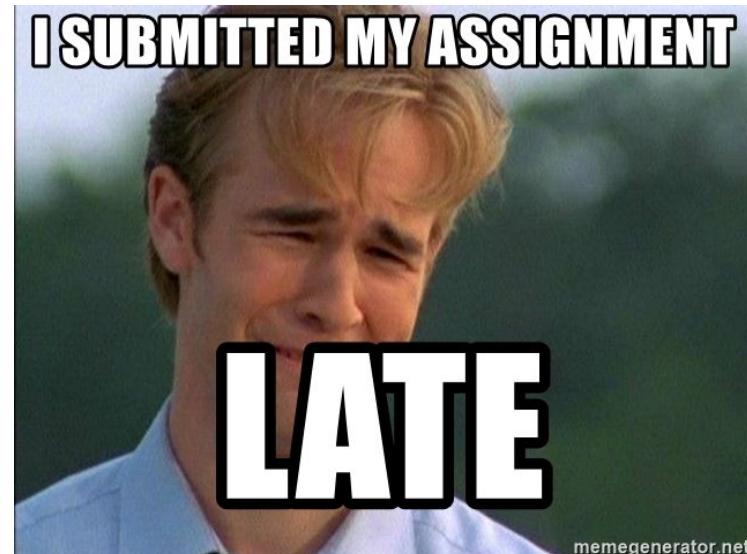
Supplementary materials

- 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 $90 - (20 \times 2) = 50$ 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

