

What are
we going to learn?

李宏毅

Hung-yi Lee

System

- A system has input and output (function, transformation, operator)

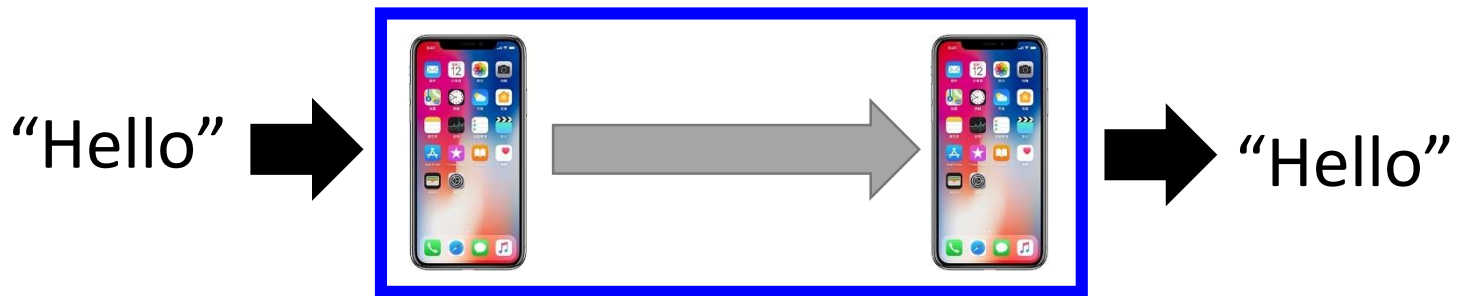
Speech Recognition System



Dialogue System (e.g. Siri, Alexa)

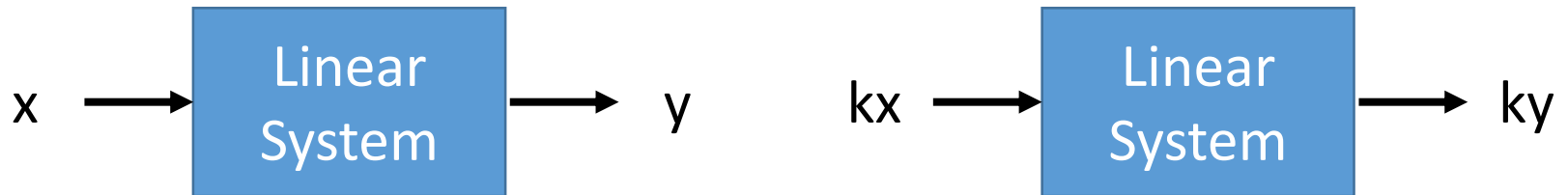


Communication System

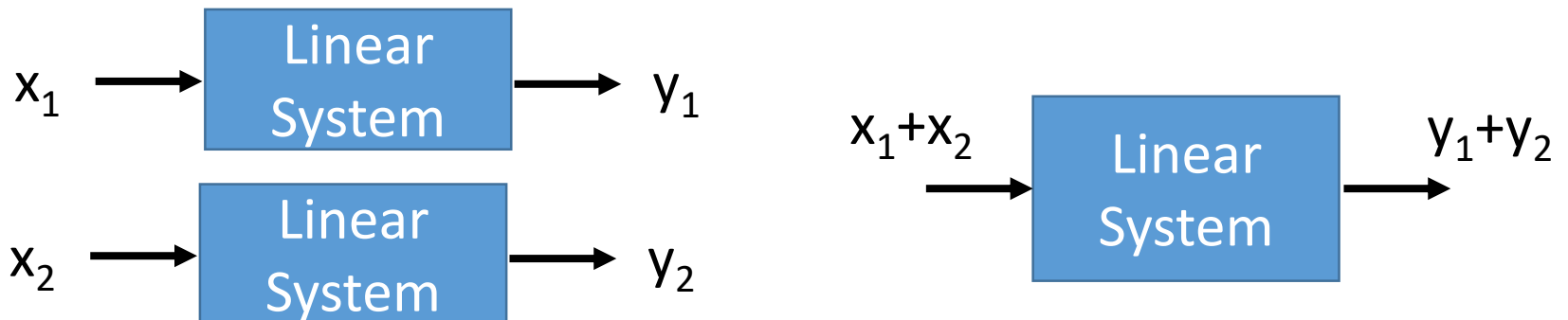


Linear System

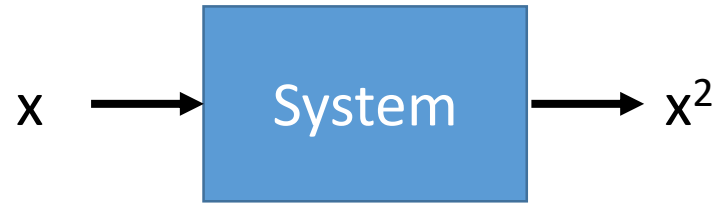
- Linear system have two properties
 - 1. Persevering Multiplication



- 2. Persevering Addition

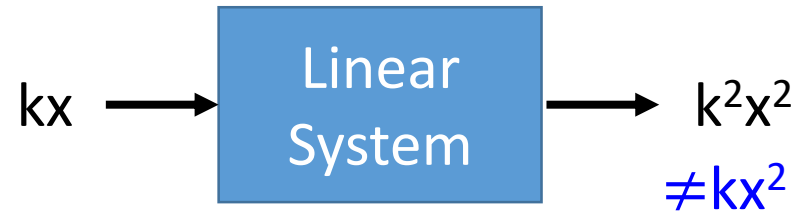
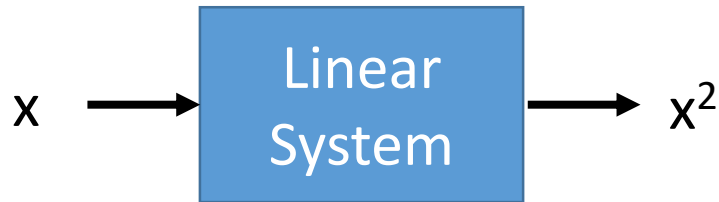


Linear System

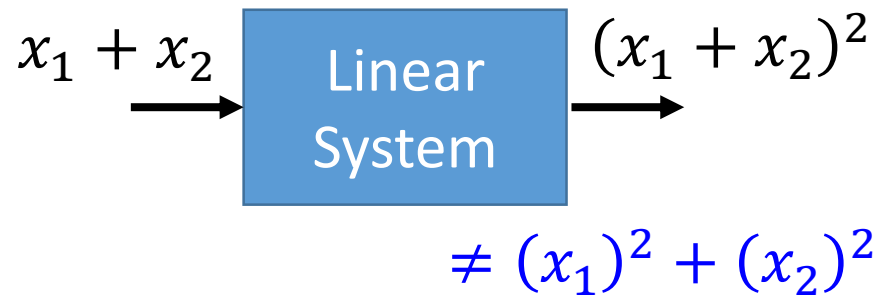
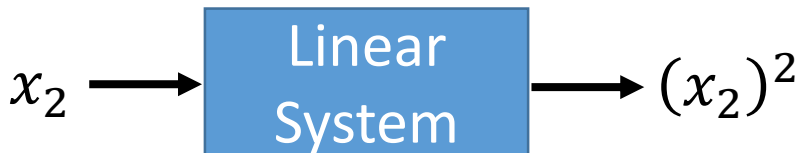
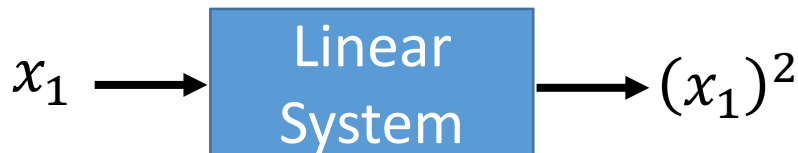


- Linear system have two properties

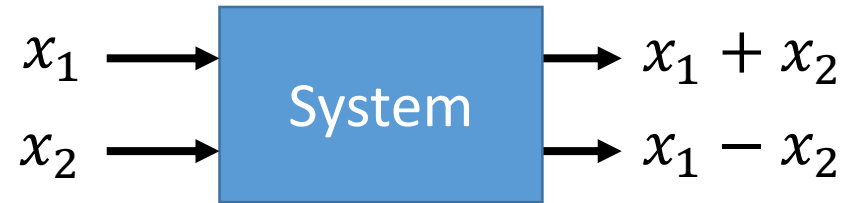
- 1. Persevering Multiplication



- 2. Persevering Addition

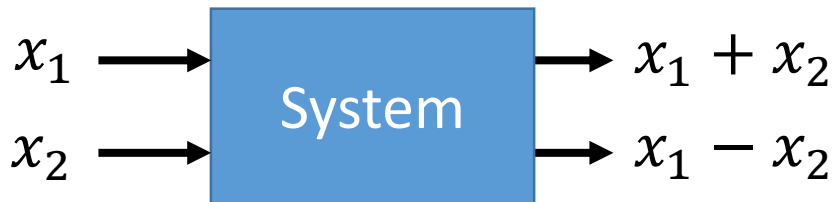


Linear System

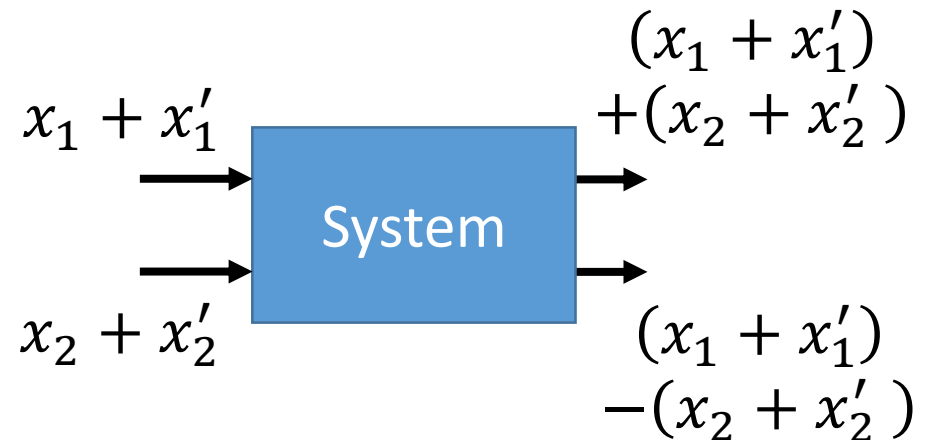
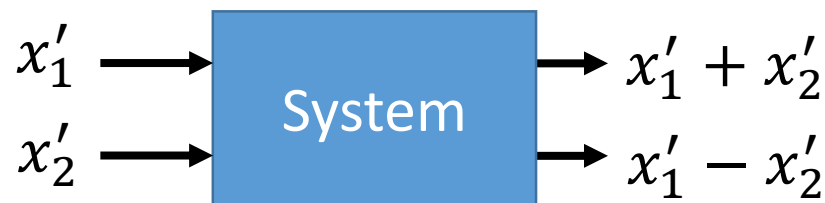
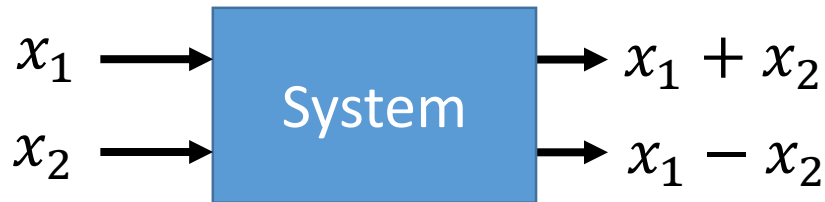


- Two properties

- 1. Persevering Multiplication



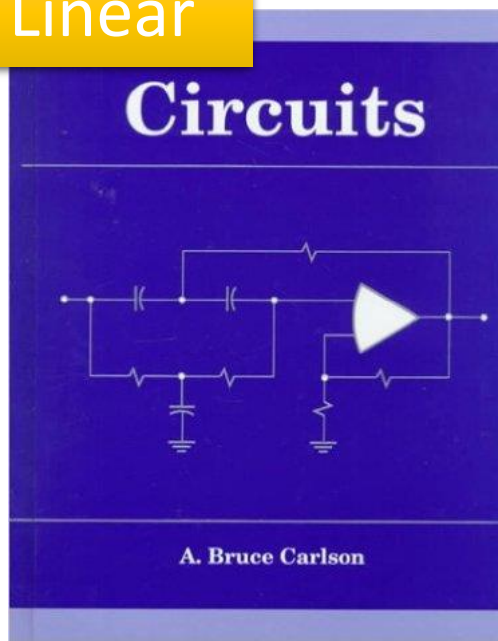
- 2. Persevering Addition



Applications

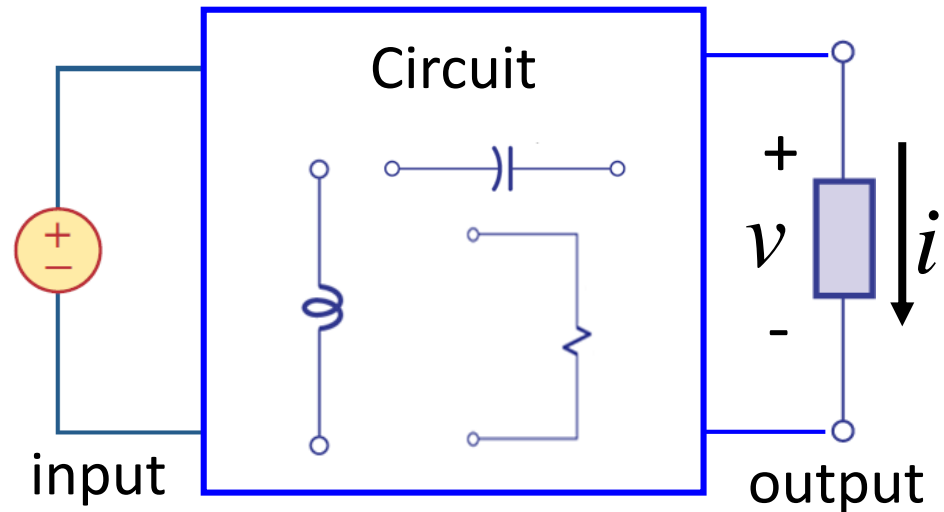
Most system are (assumed to) be linear

Linear



(大一必修)

Input: voltage source, current source
output: voltage and current on the load (燈泡、引擎)

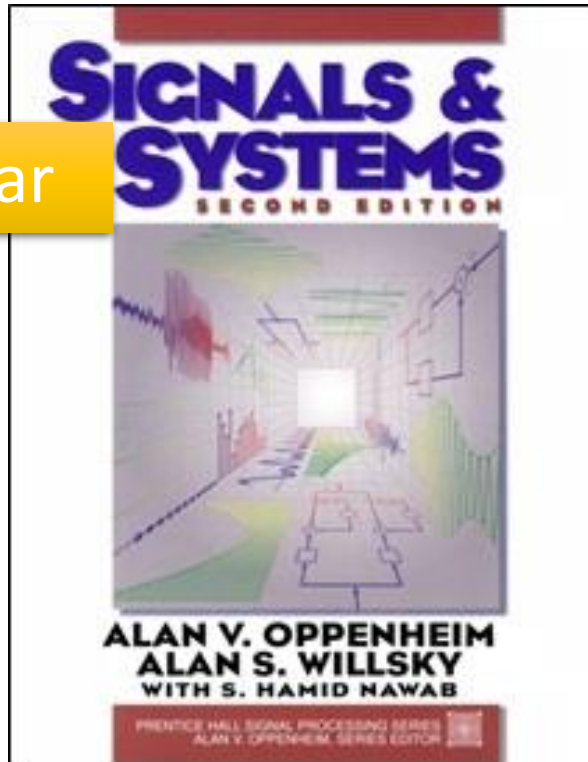


Linear System

Applications

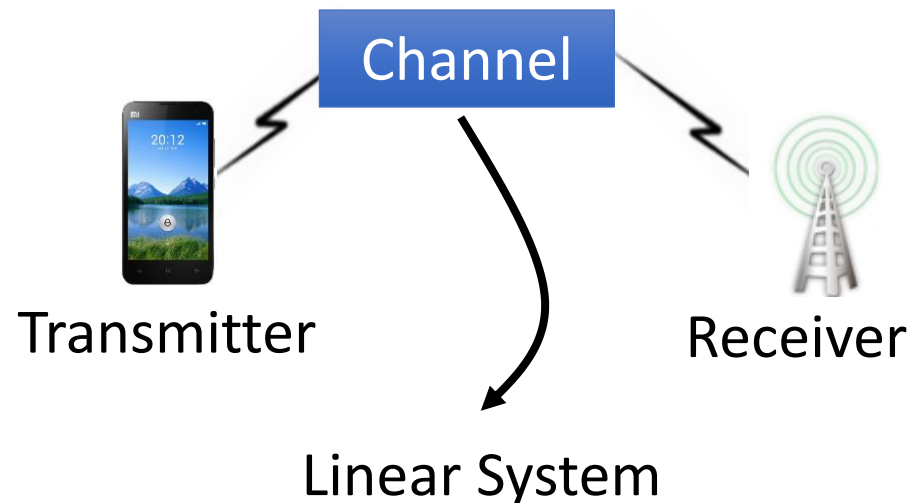
Most system are (assumed to) be linear

Linear

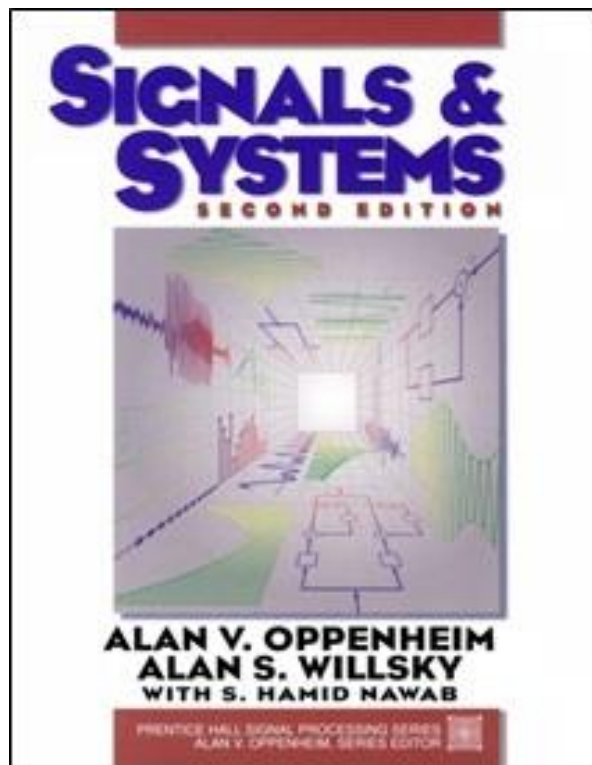


(大二必修)

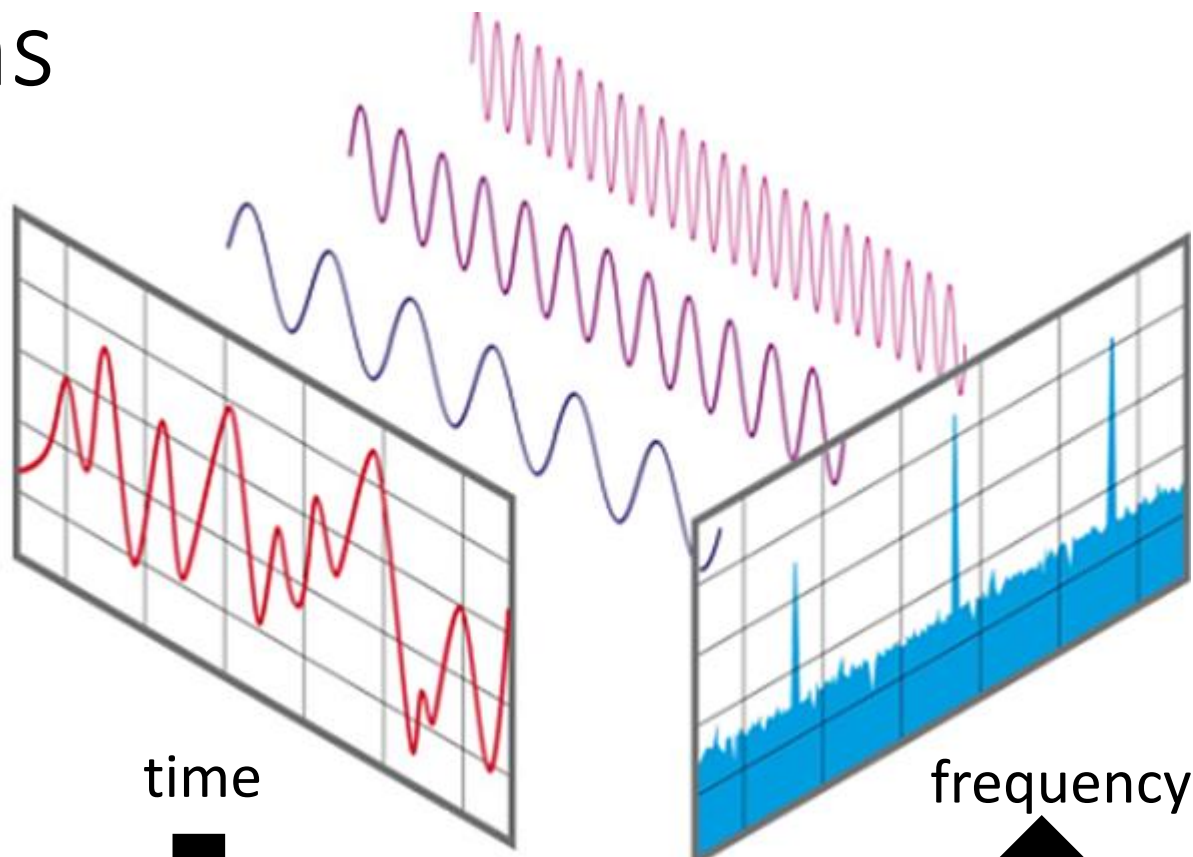
Communication System



Applications



(大二必修)



Fourier
Transform

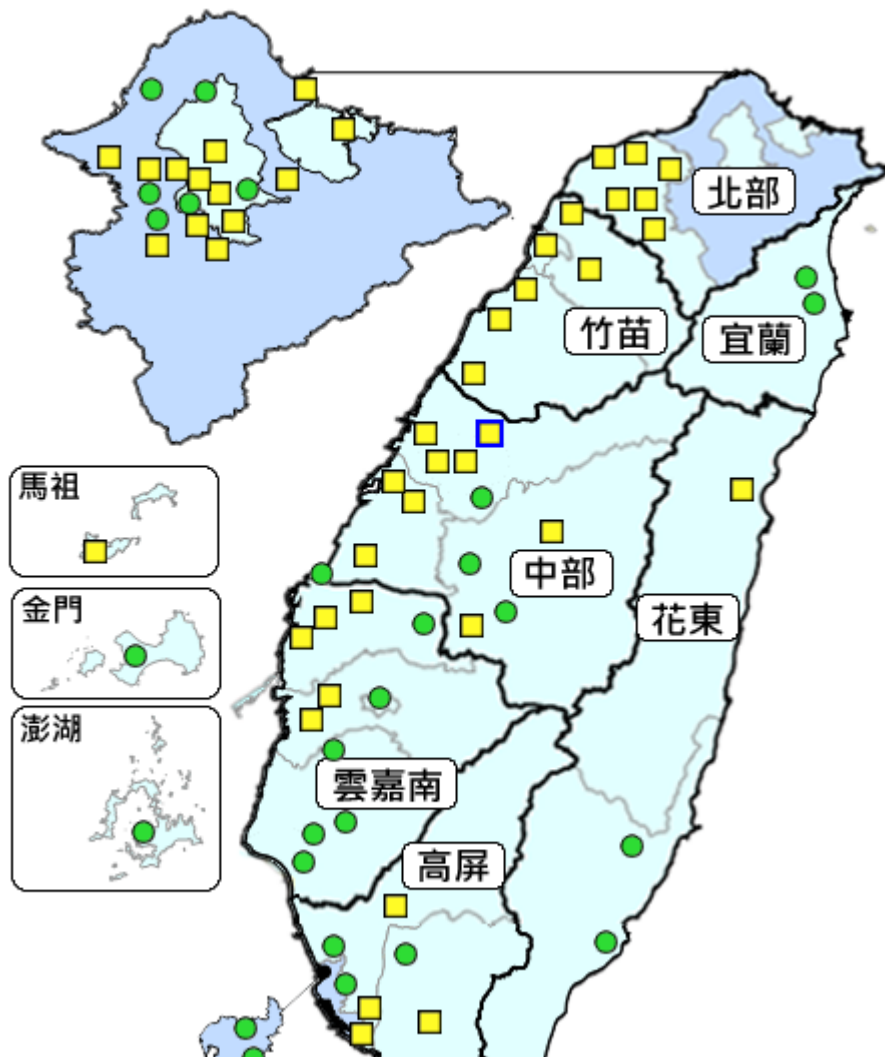
Linear System (Transform)

Applications

預測豐原站在下一個小時
會觀測到的 PM2.5

地區： >

發布時間： 2017-09-29 08:00:00



豐原 (一般站)

AQI **64**
空氣品質指標 **普通**

O ₃ (ppb) 臭氧	8小時 移動平均	17
	小時 濃度	14
◎ PM _{2.5} ($\mu\text{g}/\text{m}^3$) 細懸浮微粒	移動 平均	21
	小時 濃度	27
PM ₁₀ ($\mu\text{g}/\text{m}^3$) 懸浮微粒	移動 平均	35
	小時 濃度	44

Applications

y : A 年 B 月 C 日 N 時的 **PM2.5**

x_k : A 年 B 月 C 日 $N - k$ 時的 **PM2.5** 觀測值



Linear system

$$y = w_1x_1 + w_2x_2 + w_3x_3$$

Where do w_1 , w_2 and w_3 come from?

全部 地圖 圖片 新聞 影片 更多 ▾ 搜尋工具

Applications

P336 of Textbook

約有 5,160,000 項結果 (搜尋時間：1.01 秒)

國立臺灣大學

www.ntu.edu.tw/ ▾

包含學校簡介、系所介紹、校園資訊。成立於1928年，前身為臺北帝國大學。1945年更名為臺灣大學。

您已造訪這個網頁 3 次。上次造訪日期：2016/5/1

ntu.edu.tw 內容的搜尋結果



招生資訊

碩士班招生 - 學士班轉學考 - 碩士班甄試入學 - ...

資訊網路與多媒體研究所

碩士班 - 本所成員 - 碩士班修業規定 - 課程介紹 - ...

myNTU臺大人入口網

... 計中帳號登入！SSO1.3. 登入 - ※ 預防帳號遭盜用，請定期修改 ...

學術單位

文學院 - 工學院 - 理學院 - 生物資源暨農學院 - ...

圖書館

館藏資源 - 電子資源 - 資料庫 - 開放時間 - 學生 - ...

國立臺灣大學學士班轉學考試

招生名額及科目 一般生(不招收陸生)陸生(限在臺就讀). 預定日程 - ...

國立臺灣大學- 維基百科，自由的百科全书

<https://zh.wikipedia.org/zh-tw/國立臺灣大學> ▾

國立臺灣大學，簡稱臺灣大學、臺大，乃臺灣最早的現代綜合大學，前身是於1928年創立的臺北帝國大學，籌設之初定位為只辦醫學和農學的實業大學，伊澤多喜男力排 ...

國立臺灣大學National Taiwan University - Facebook

www.facebook.com ▾ Places ▾ Taipei, Taiwan ▾ Landmark ▾

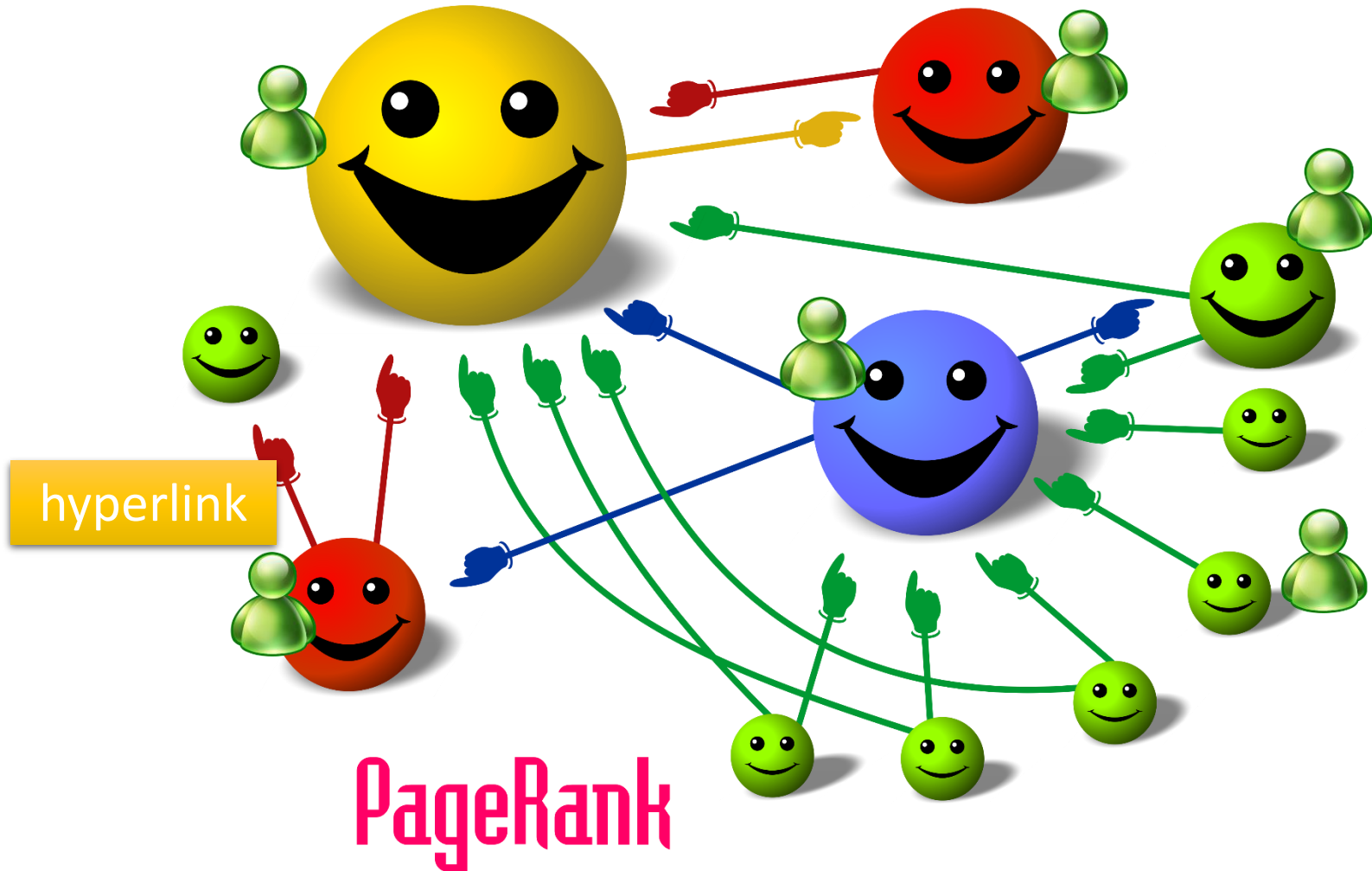
★★★★ 評分：1.8 - 11,822 票

國立臺灣大學National Taiwan University, Taipei, Taiwan. 37715 likes · 1580 talking about this · 175196 were here. 國立臺灣大學粉絲專頁.

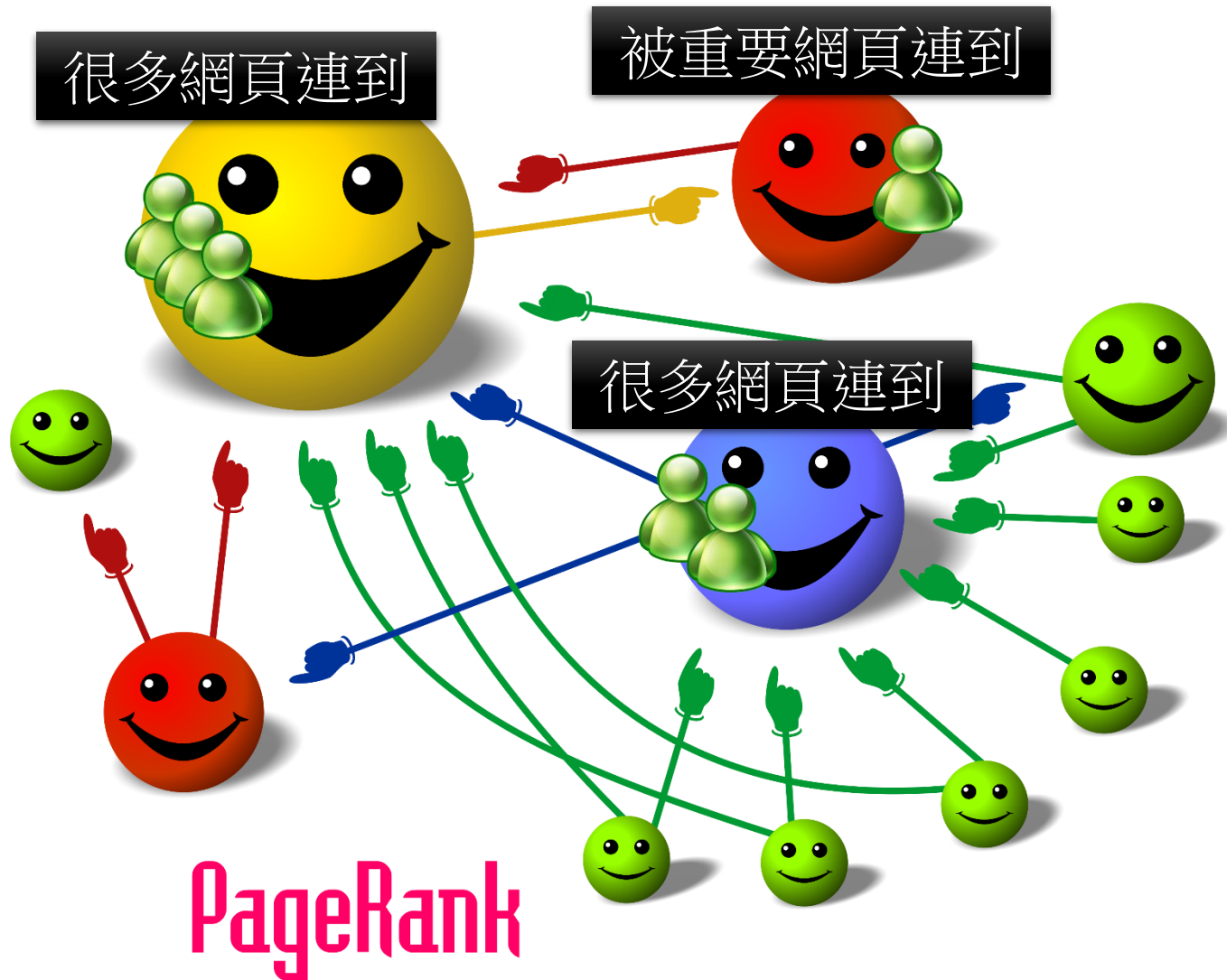


<http://incomebully.com/does-pr-pagerank-still-matter/>

Applications - PageRank

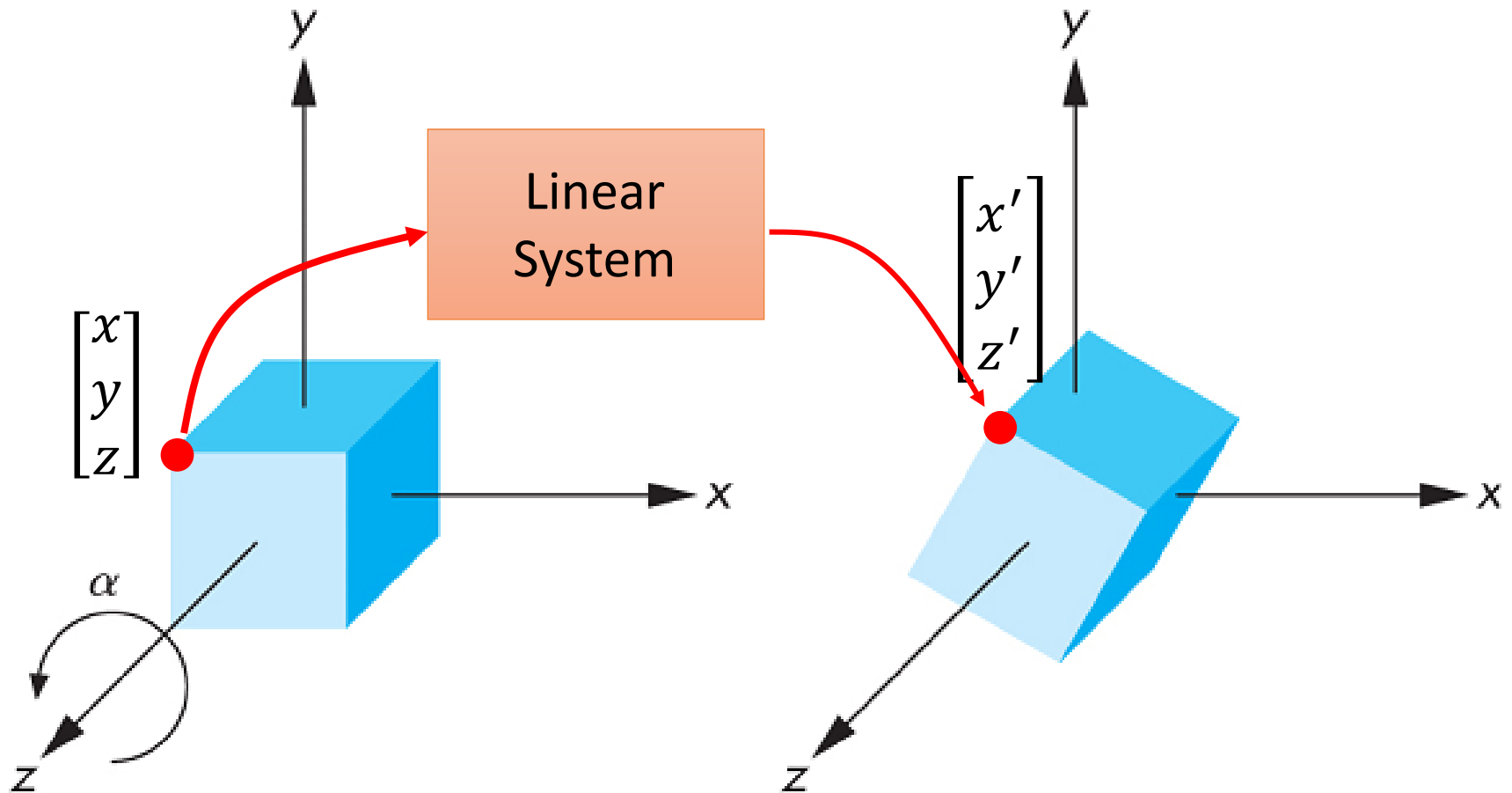


Applications - PageRank



Applications - Computer Graphics

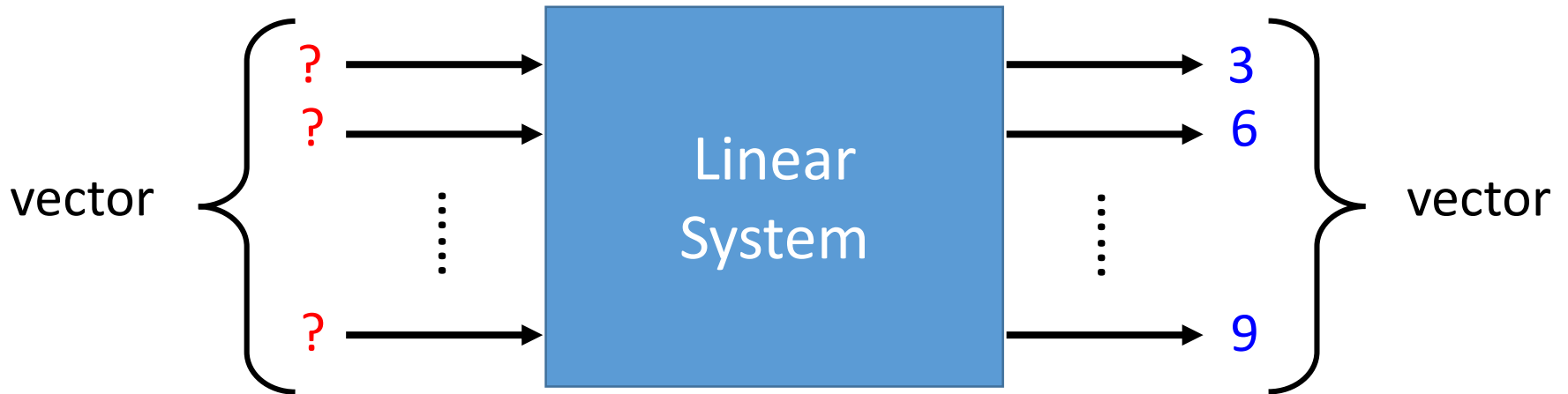
Section 7.9 of Textbook



What are we going to learn?

Chapter 1, Chapter 2, Chapter 3

Beyond vector
in Chapter 6



Does it have
solution?

Does it have
unique solution?

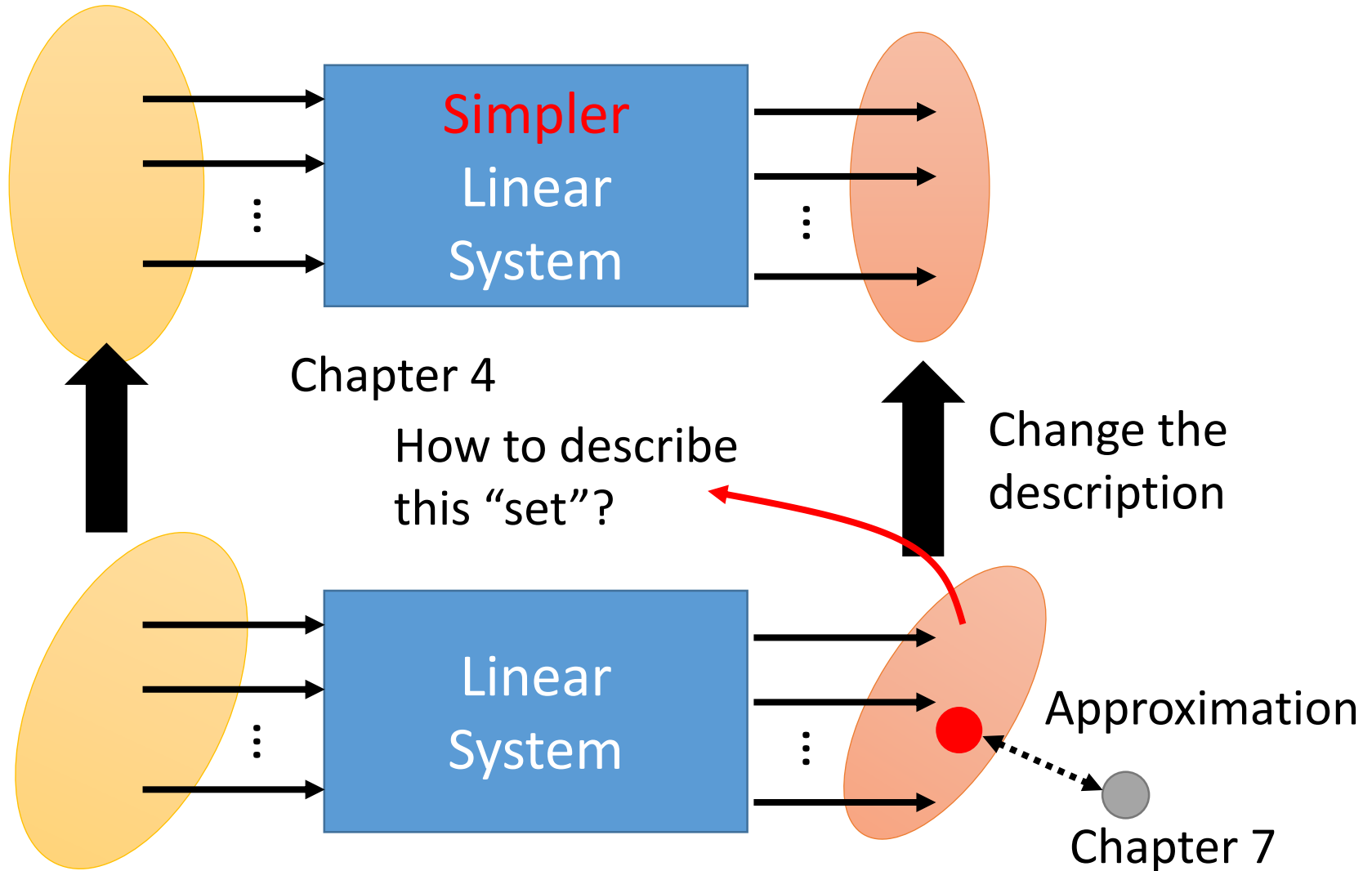
How to find
the solution?

Determinants
(行列式)

Beyond 3 X 3

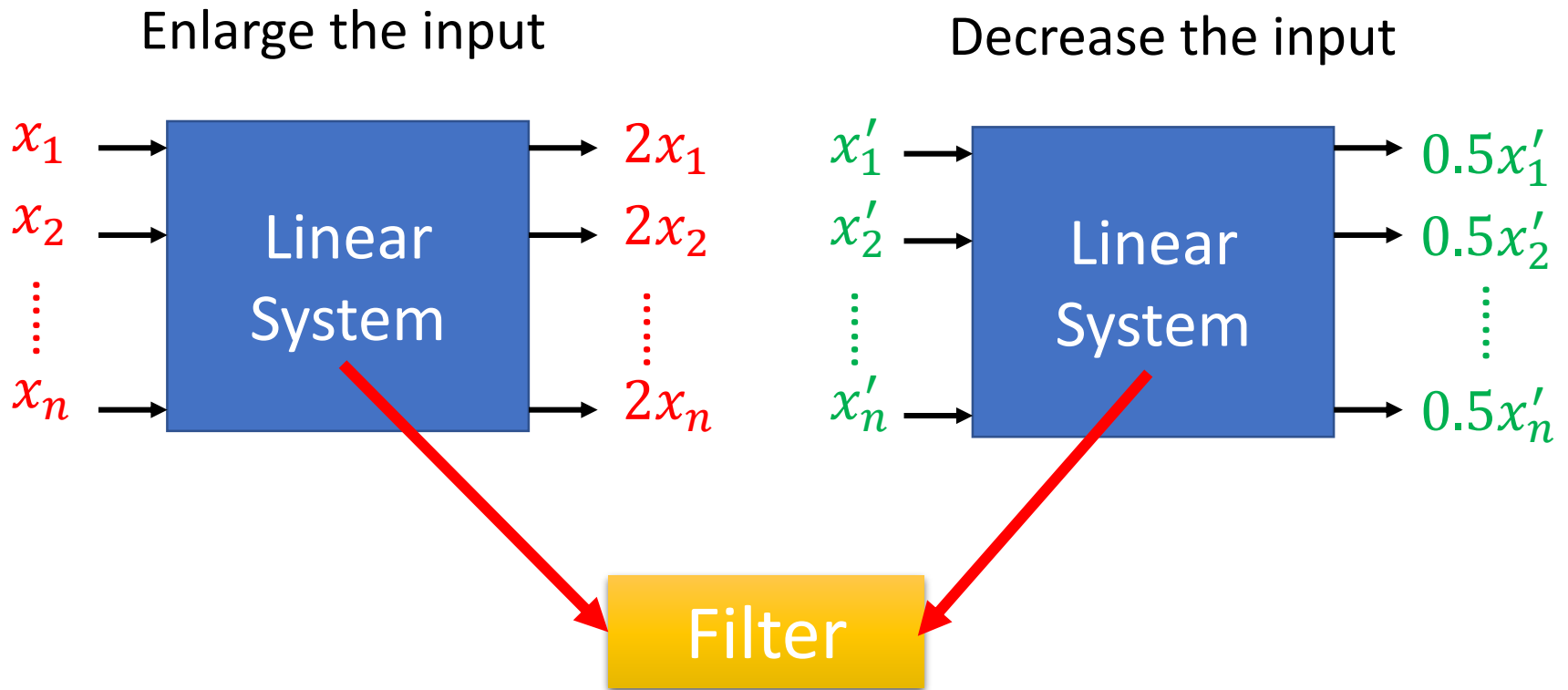
Different view from high school

What are we going to learn?



What are we going to learn?

- Chapter 5: EigenXXX



Linear Algebra is Important



在電機系
如果沒有把線性代數學好
就好像沒有學念能力

卻到了天空鬥技場兩百樓

李宏毅