

NARLabs 國家實驗研究院

國家地震工程研究中心

學結構控制懂做人

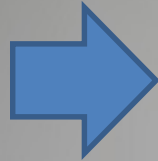
科普演講

2019/05/24

楊卓諺助理研究員

Input, x
(excitation)

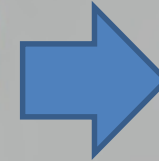
- 遲到
- 出包
- 怠惰
- 積極
- 完成任務
-



Hey, I'm your boss!

Output, y
(response)

- 斥責
- 減薪
- 解雇
- 鼓勵
- 獎金
-



$$y=f(x)$$



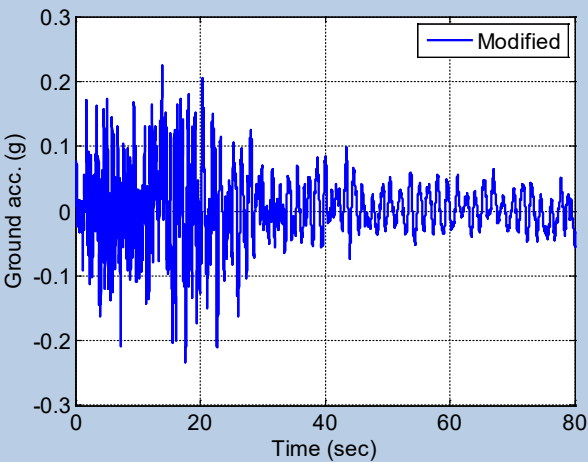
$$response=boss(excitation)$$

<http://milewalk.com/mwblog/describe-your-ideal-boss/>

System identification!

擬人化!

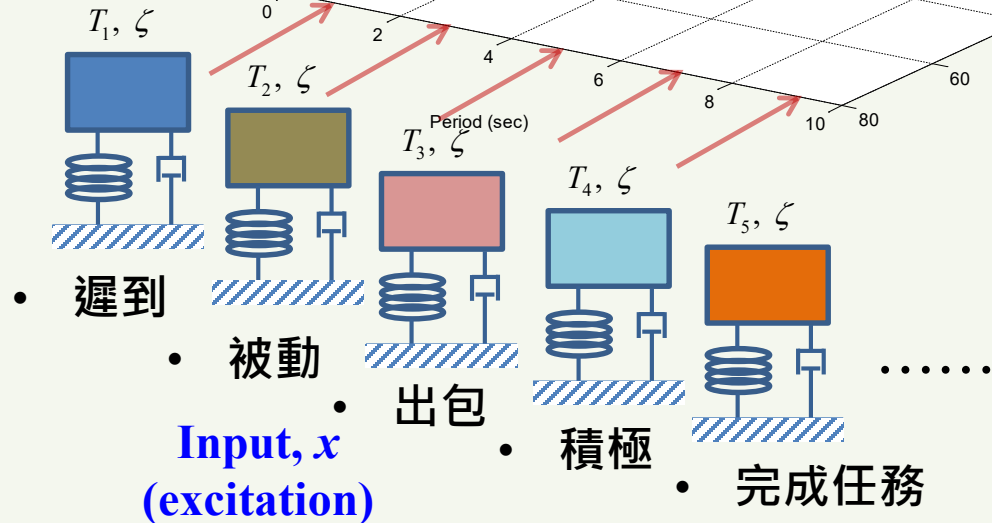
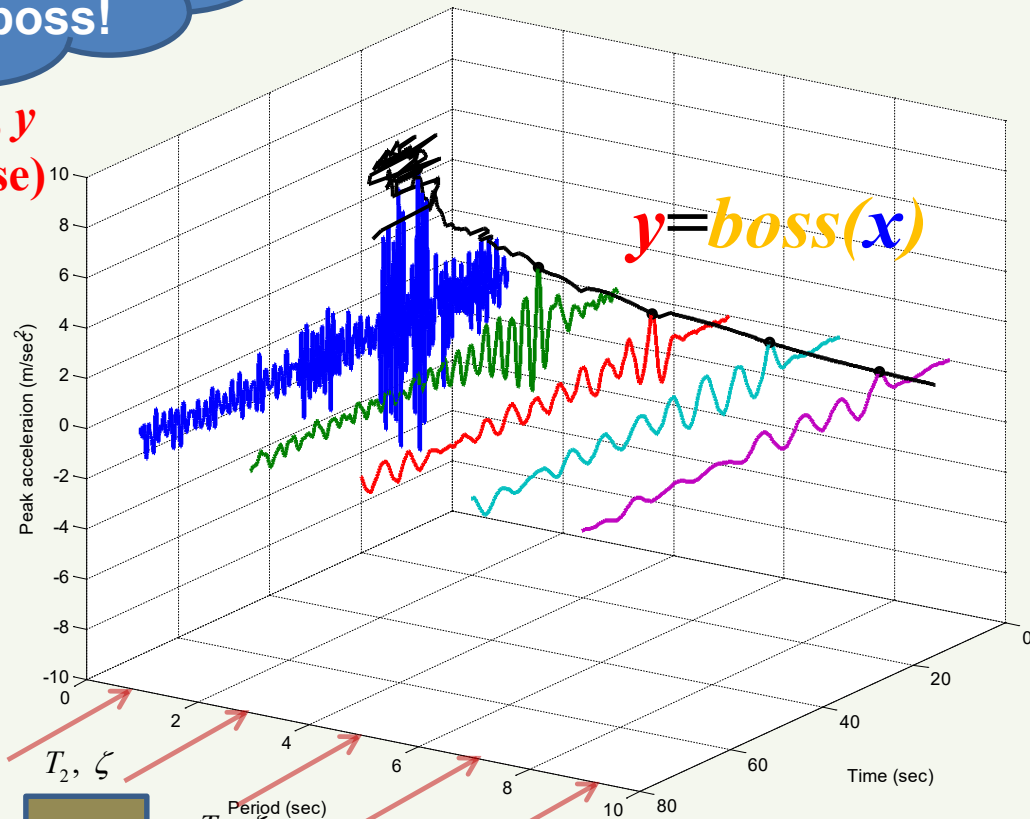
My name is
"Earthquake,"
I'm your boss!



Chi-Chi TAP097
(spectrum compatible)

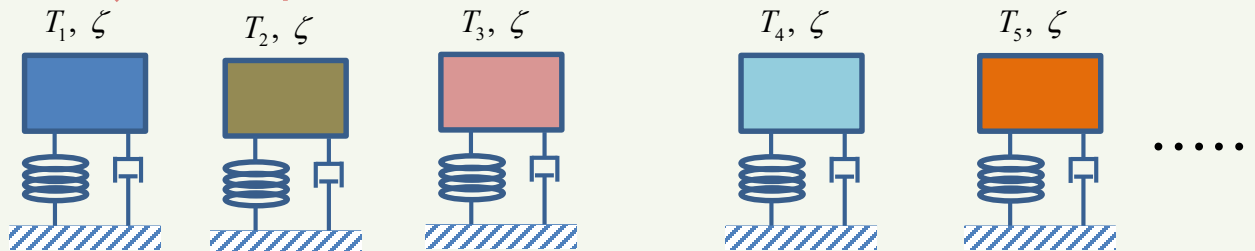
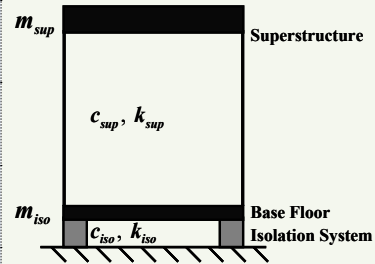
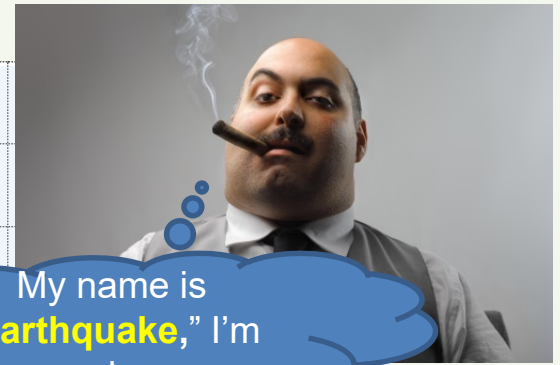
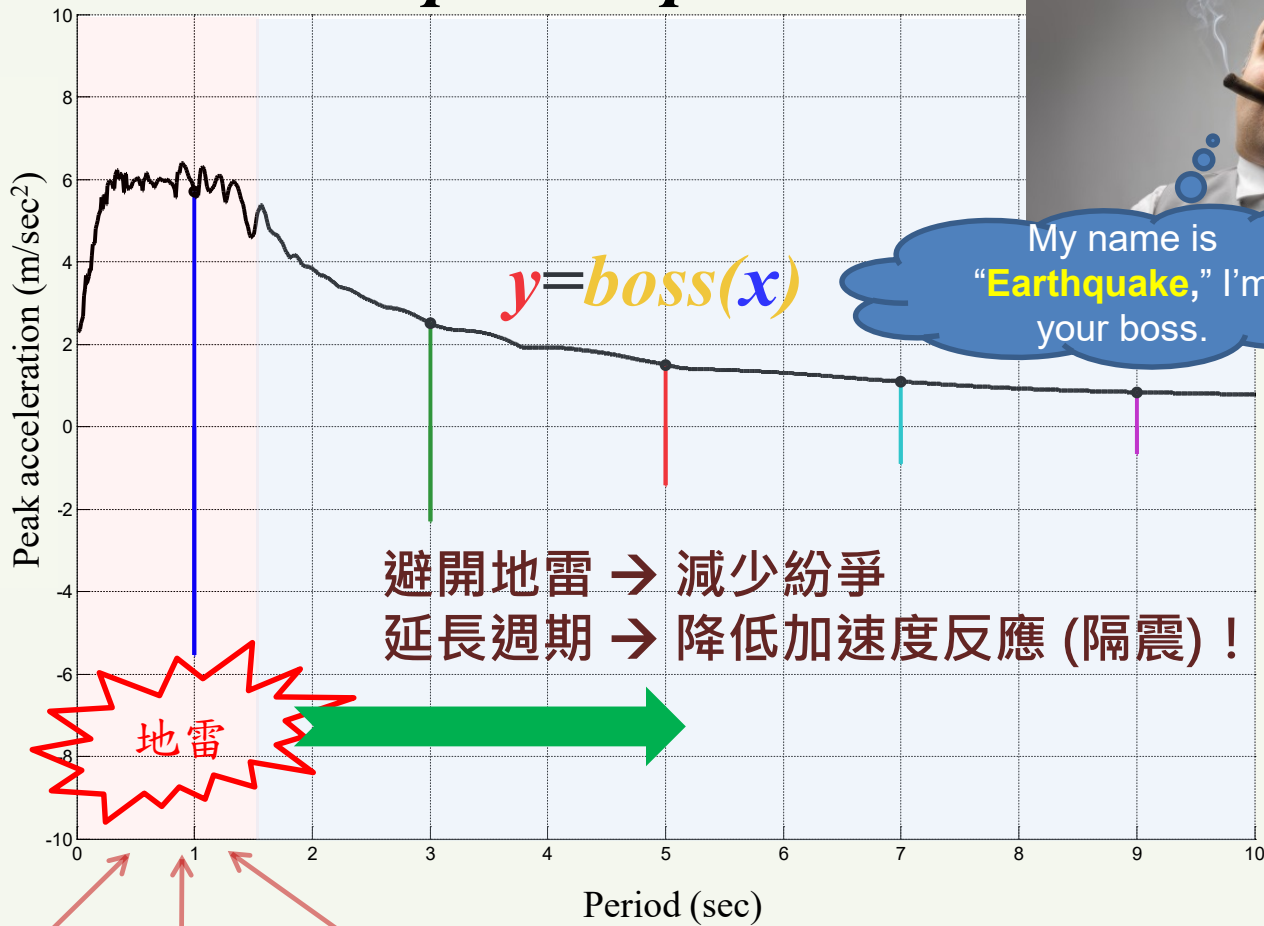
Output, y
(response)

- 斥責
- 減薪
- 解雇
- 鼓勵
- 獎金



Response Spectrum

- 斥責
- 減薪
- 解雇
- 鼓勵
- 獎金



- 遲到
- 被動
- 出包
- 積極
- 完成任務

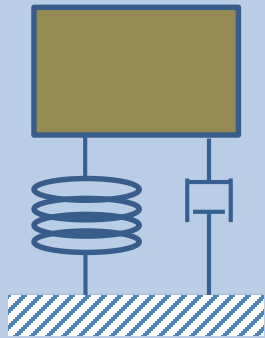
擬人化!

My name is
"Structure Chou"
Nice to meet you!



<http://www.epochtimes.com>

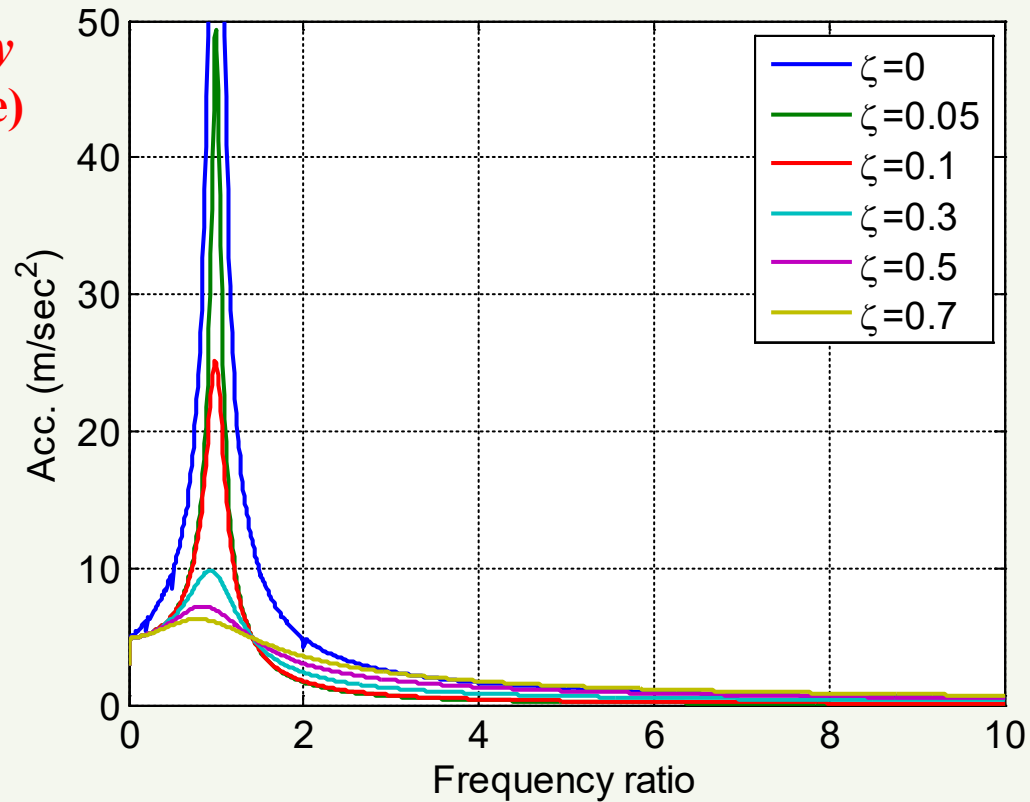
T, ζ



($T = 1.0 \text{ sec}$)

Output, y
(response)

- 感動
- 雀躍
- 開心
- 冷漠
- 厭惡
-

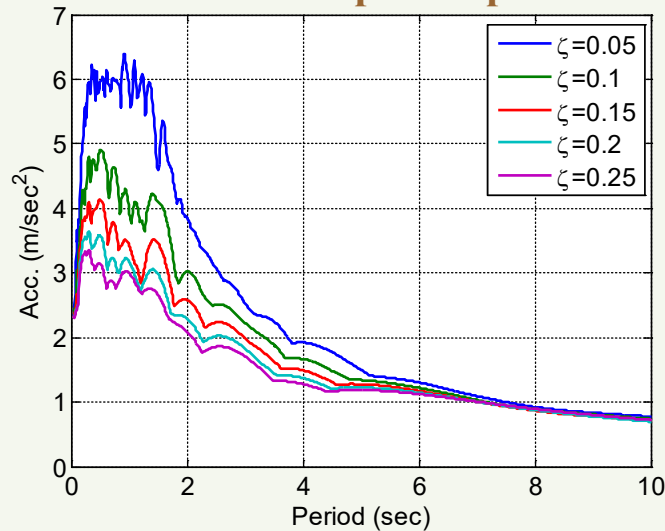


- 關心
 - 旅遊
 - 讚美
 - 美食
 - 鮮花 ...
- $A_0 \sin(\bar{\omega}_1)$ $A_0 \sin(\bar{\omega}_2)$ $A_0 \sin(\bar{\omega}_3)$ $A_0 \sin(\bar{\omega}_4)$ $A_0 \sin(\bar{\omega}_5)$

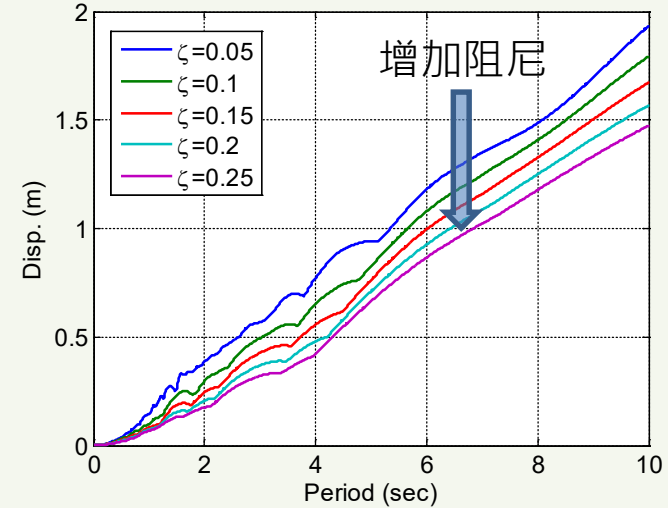
Input, x
(excitation)

How about *damping*?

Acceleration response spectrum

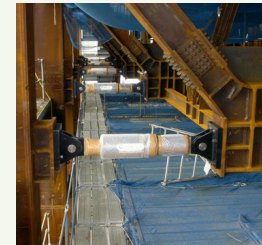


Displacement response spectrum



耐震設計：

- 外加阻尼器(damper)提升結構阻尼比(ζ)
→ 降低結構受震反應



人與人相處：

- 額外之休閒活動或嗜好
→ 消散負面的情緒，迅速回復平靜



在人與人相處的過程中，其實我們早就已經懂了：

- ✓ 系統識別(System identification)
- ✓ 反應譜(Response Spectrum)
- ✓ 頻率響應(Frequency Response)
- ✓ 隔震(Isolation)
- ✓ 減震消能(Energy Dissipation)

報告完畢
謝謝聆聽