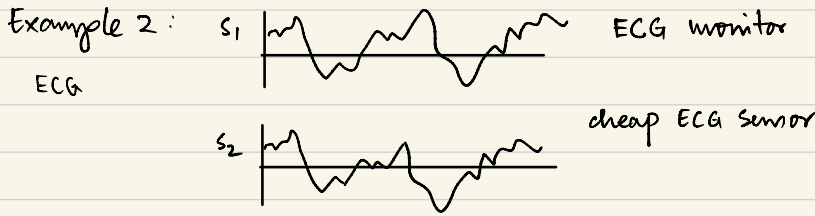
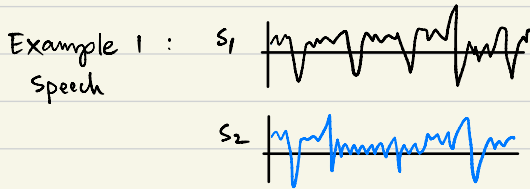


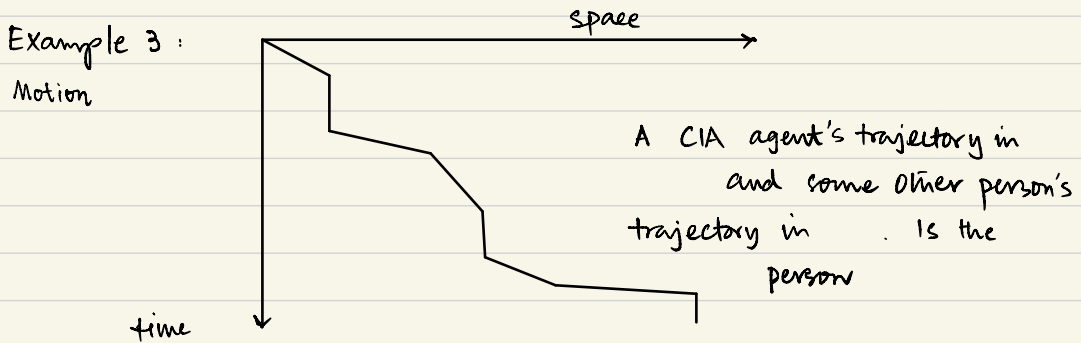
ECE/CS 434 : Dynamic Time Warping

➔ Many applications require comparing signals (i.e., time series data)



can we

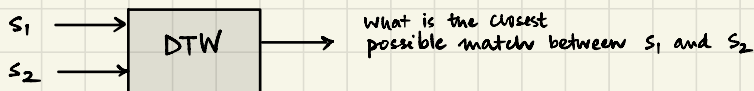
and identify which segments



➔ Any other example in which

won't work ?

②



③ let's model the problem for speech recognition

A L L E X A A
 A
 A
 L
 E
 E
 X
 A

Vertical motion :

signal

Horizontal motion :

signal

We want to find the
 that connects top left to bottom right
 corner.

④ How do we define cost ?

$$\text{Cost of route (R)} = \sum_v$$

$$\text{Node cost } d(i, j) =$$

e.g., dissimilarity (A, A) =

Dissimilarity matrix :

A L E X

A

L

E

X

⑤ DTW algorithm :

$$c(c_j, r_j) =$$

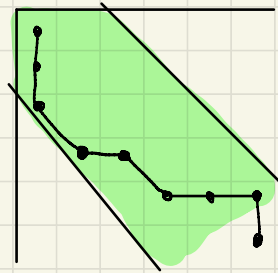
②

A L L E X A A
A
A
L
E
E
X
A

Dissimilarity :

| | A | L | E | X |
|---|---|---|---|---|
| A | 0 | 5 | 2 | 3 |
| L | | 0 | 3 | 4 |
| E | | | 0 | 3 |
| X | | | | 0 |

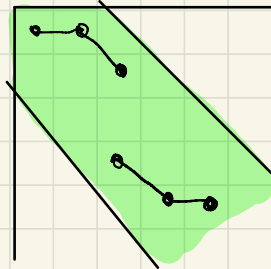
③ Constraints : (i)



Restrict to green region, i.e.,

too many in one shot.

(2) No



(3) No

