* Preprocess / Smoothen
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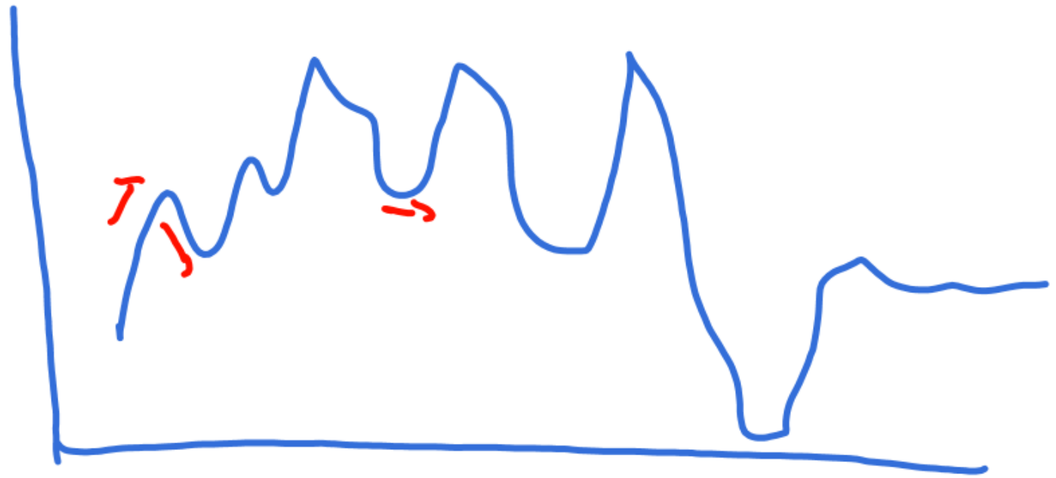
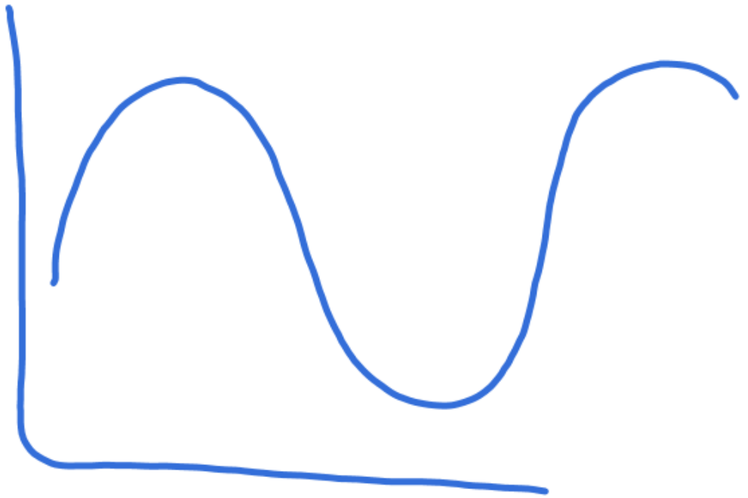
* Try different classifiers

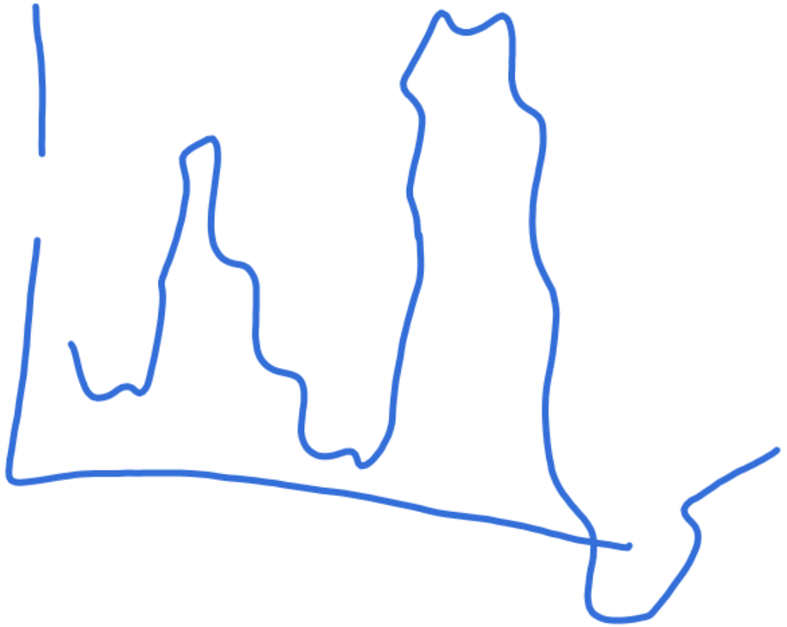


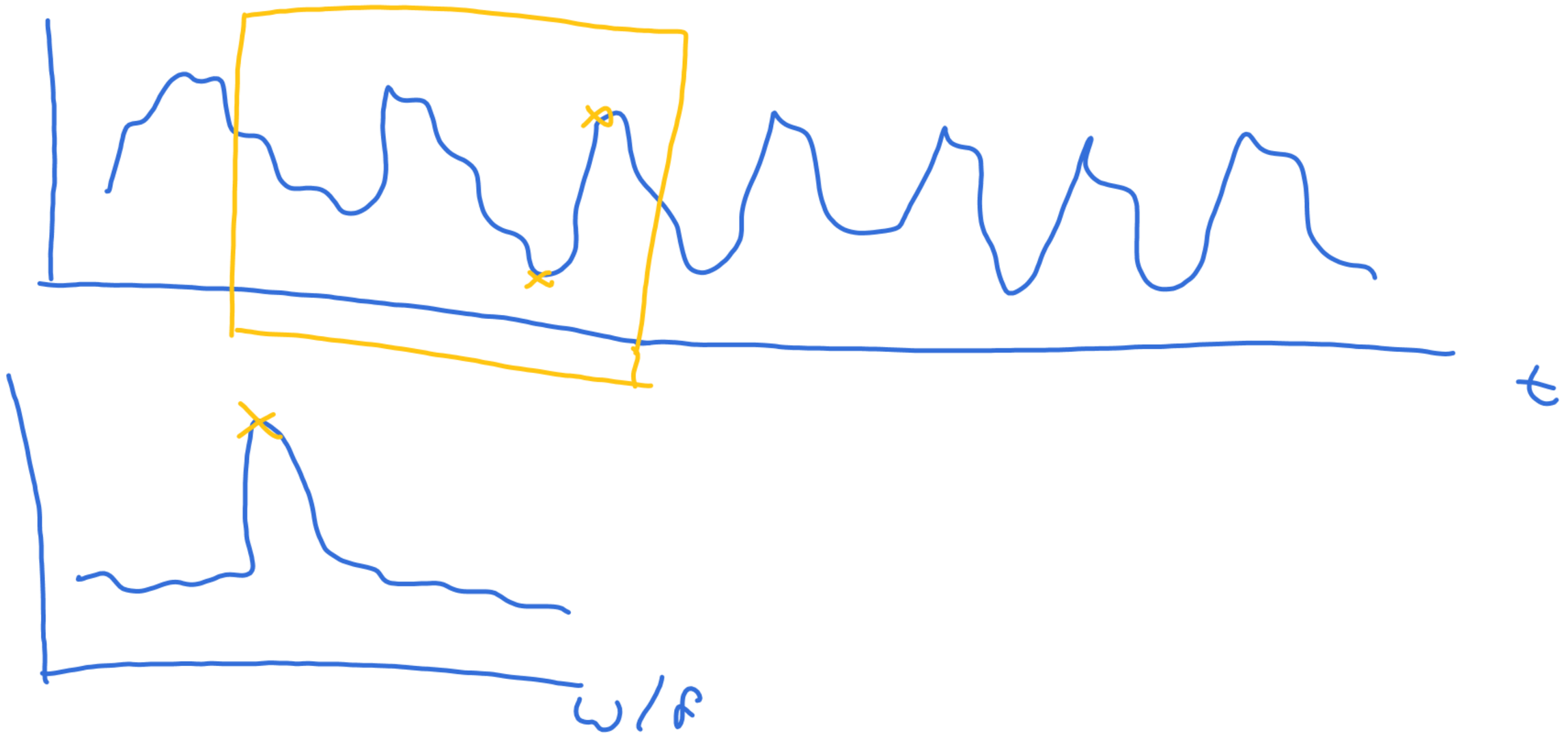
Naive Bayes'

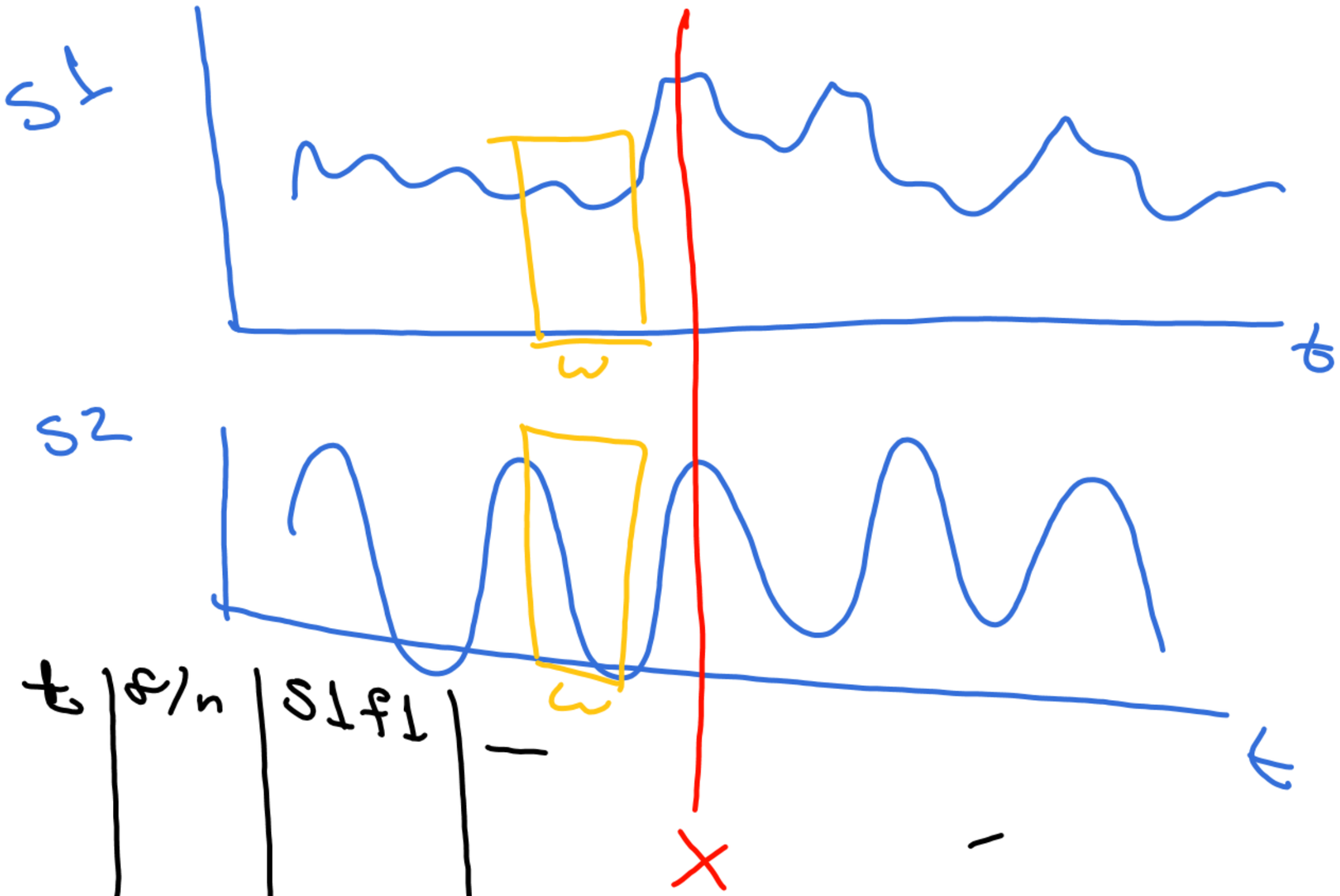
$$P(c|x) \propto \underbrace{P(c|x_1) \cdot P(c|x_2) \cdot \ldots \cdot P(c|x_m)}$$

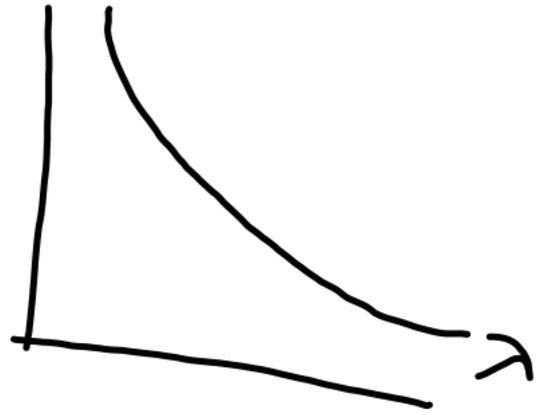
Independence of features

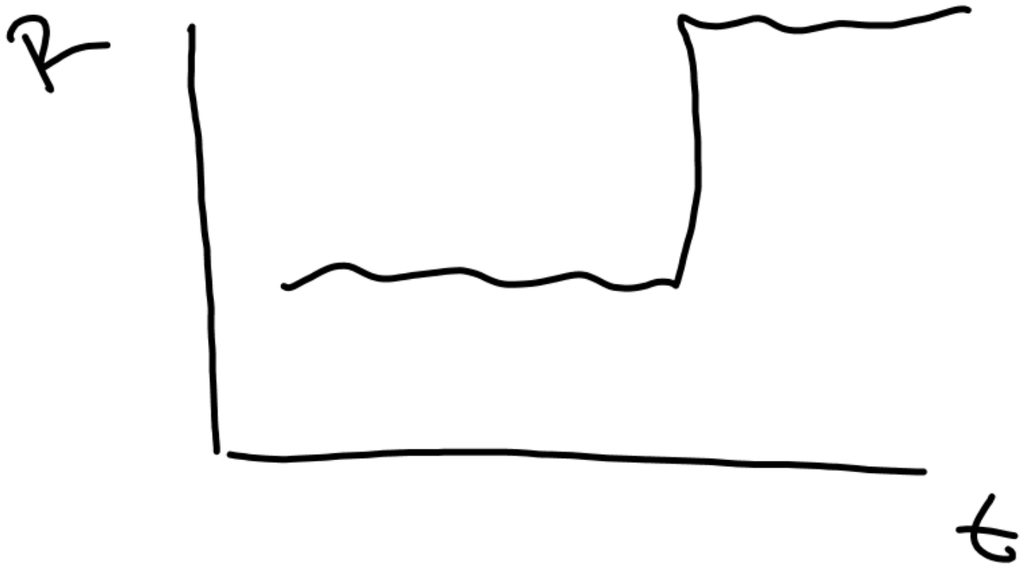





t
ω/s


S1
t
ω
S2
ω
t
X


λ


R
t

Chemometrics

⇒ PLS Partial Least Squares

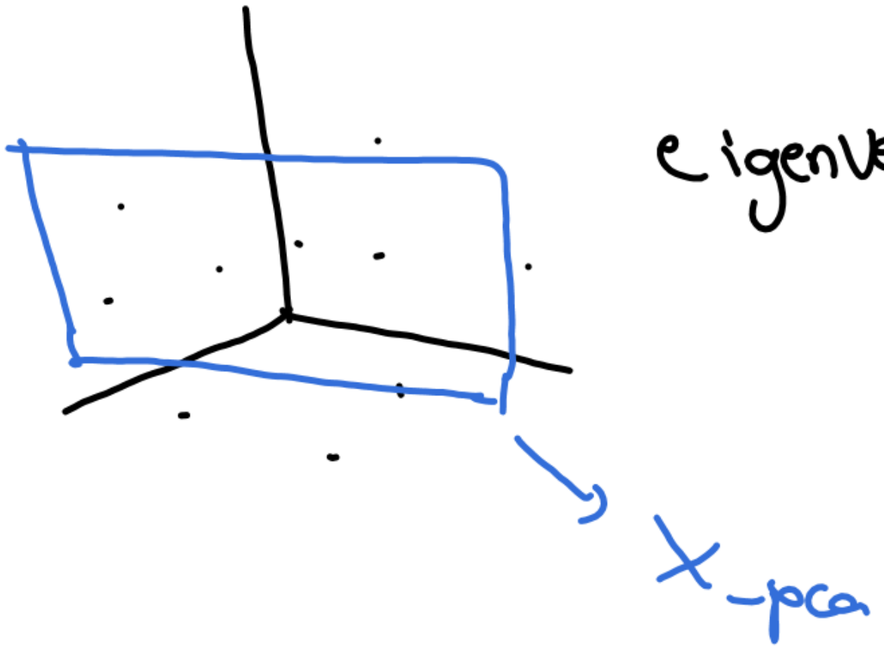
Projection to Latent Structures

PCA

(X, y)

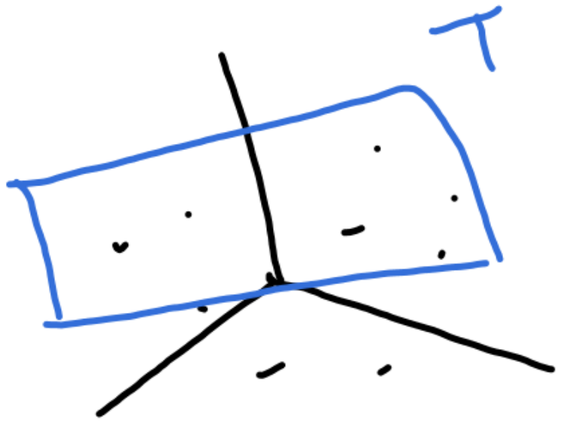
$$X = \underbrace{\left(x_1 \mid x_2 \mid \dots \mid x_m \right)}$$

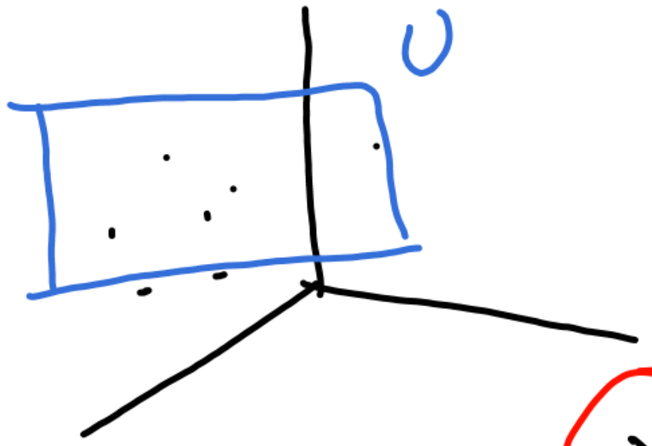
$$\text{eigenVec}\left(\text{COV}\left(X\right)\right)$$

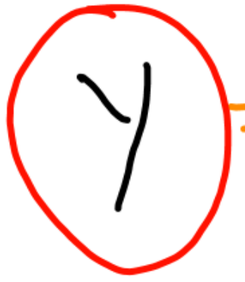


$X_{\text{-pca}}$

PLS







=> Y can be matrix

X

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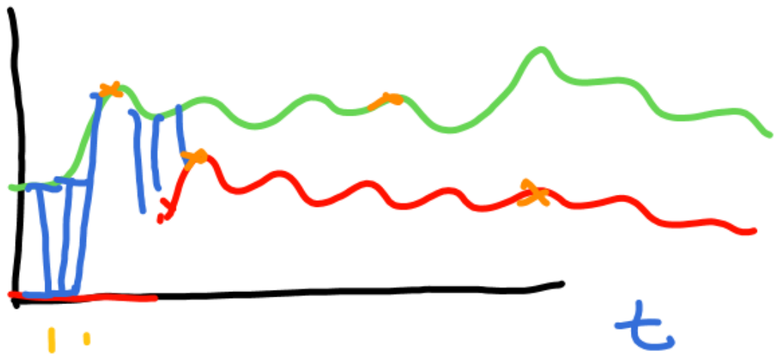
$Y \simeq f(X)$

$cov(T,T) \cdot cov(U,U) \cdot \underline{cov(T,U)}$

How to compare time series?

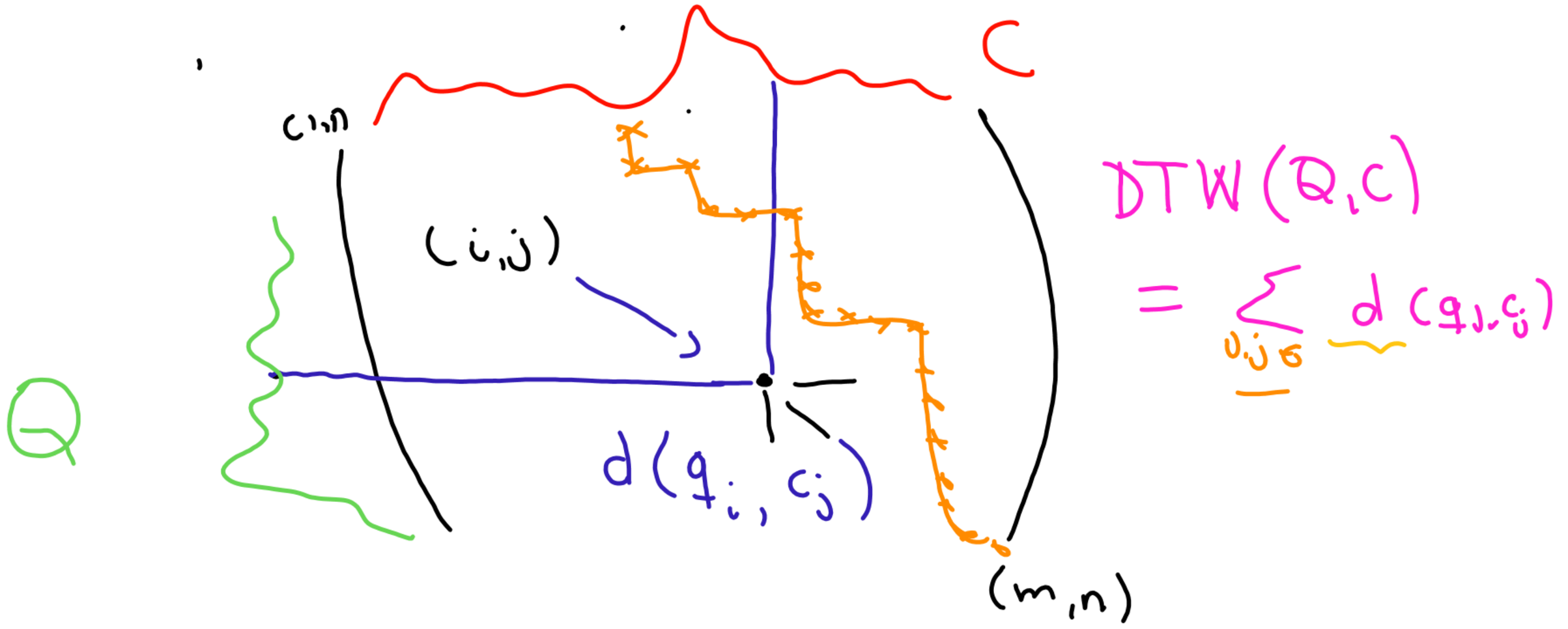


- Amplitudes
- F. Transform
- Shifts

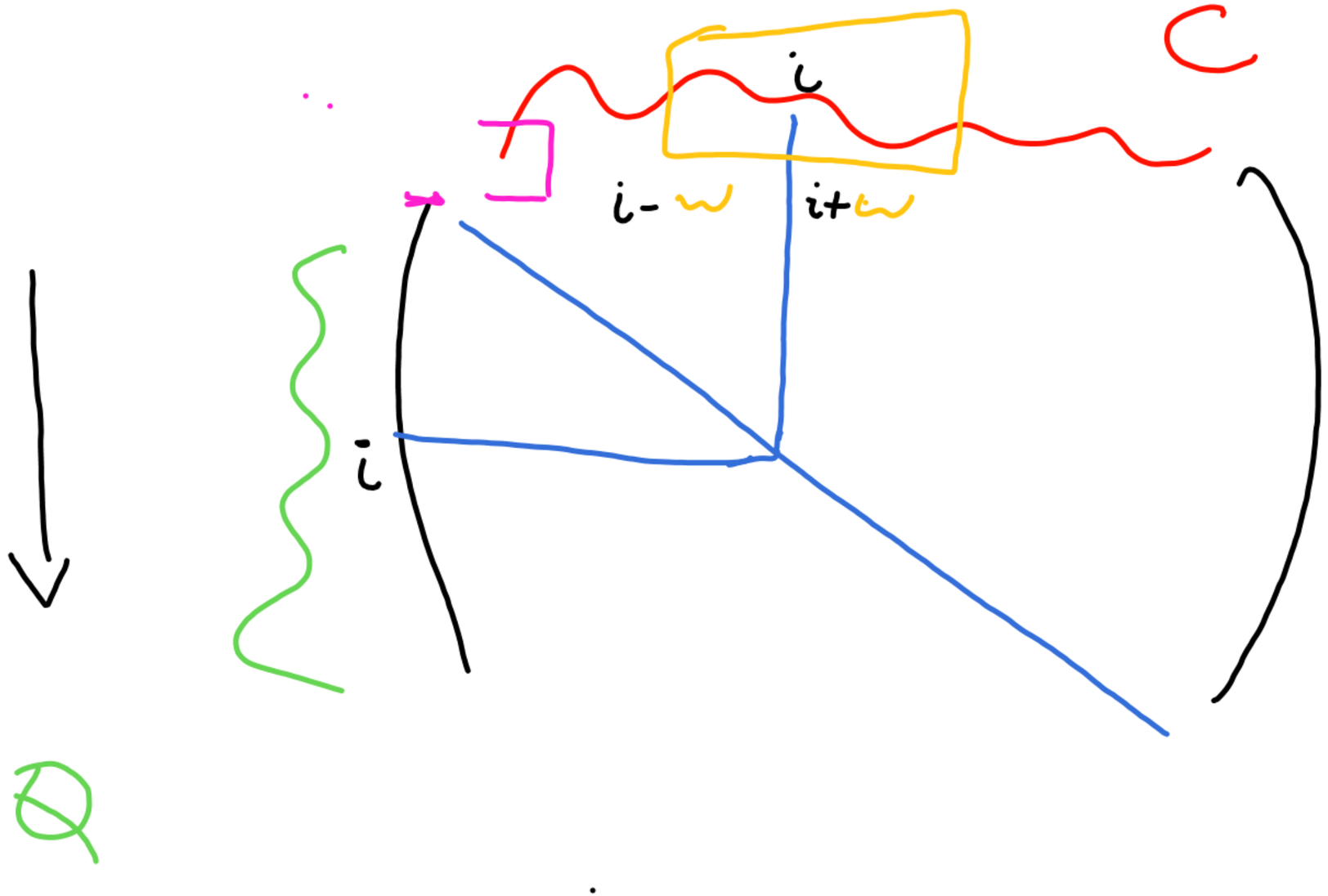
manually ✗

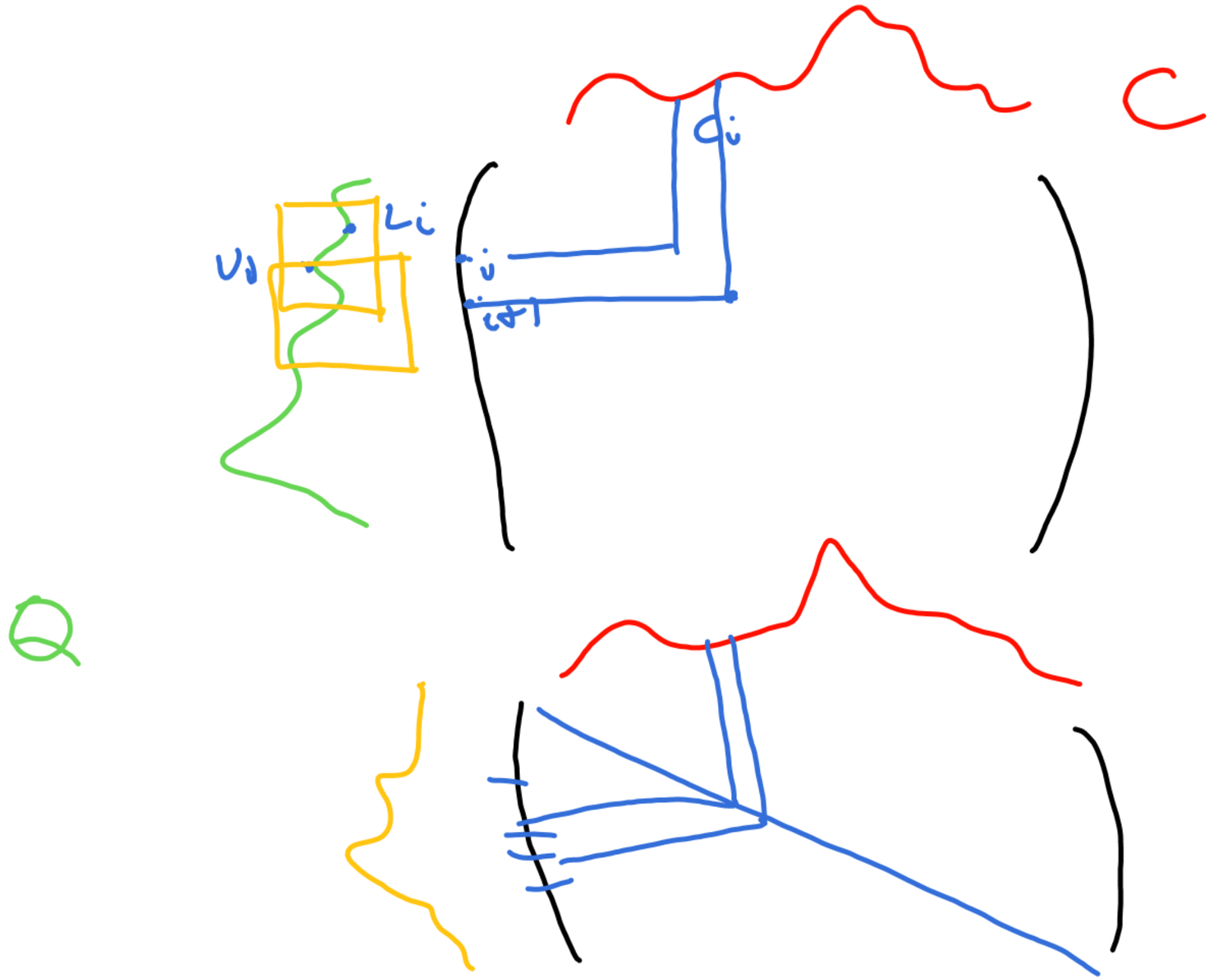
-

DTW = Dynamic Time Warping



$$DTW(Q,C) = \min_{w,i,j} \sum d(q_i, c_j)$$


i
C
i-ω
i+ω
i
Q


C
Q

$$DTW(q_i, c_j) = d(q_i, c_j)$$

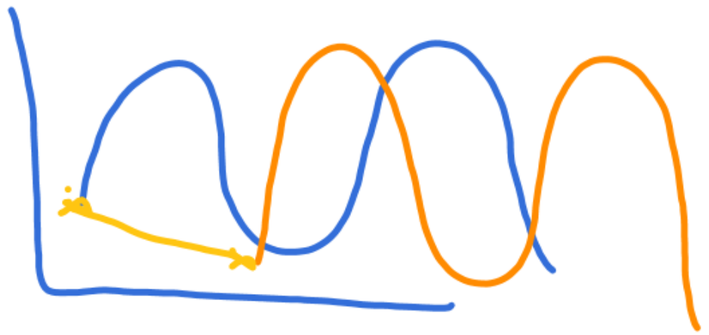
$$+ \min \{ DTW(q_i, c_{j+1}),$$

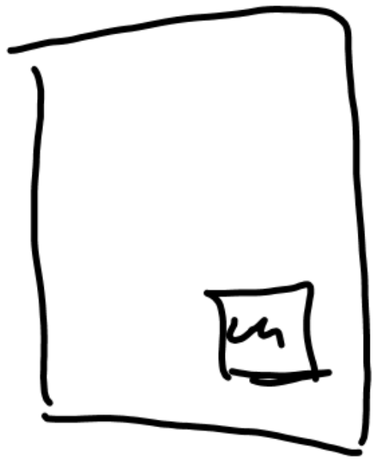
$$DTW(q_{i+1}, c_j),$$

$$DTW(q_{i+1}, c_{j+1}) \}$$

$$-\gamma \| q_i - c_j \|^2$$

$$e$$





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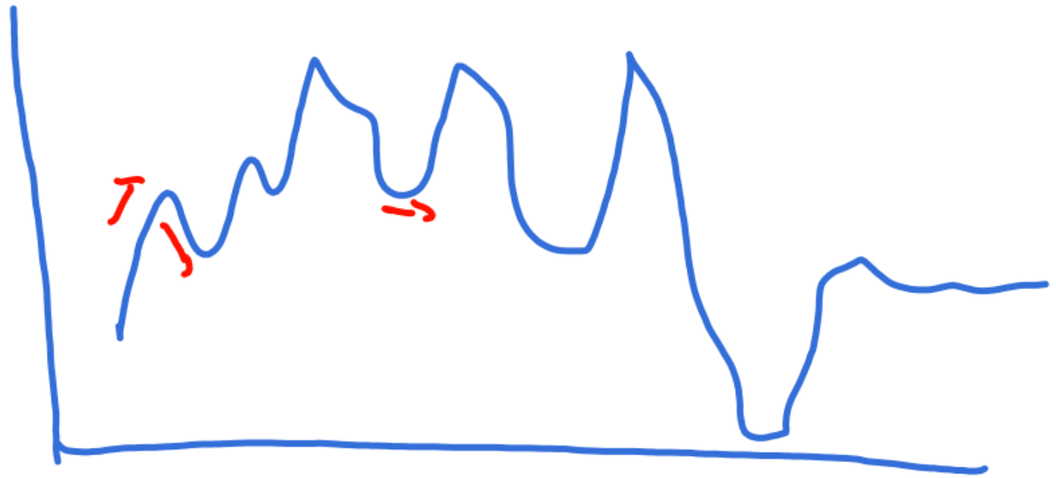

Naive Bayes:

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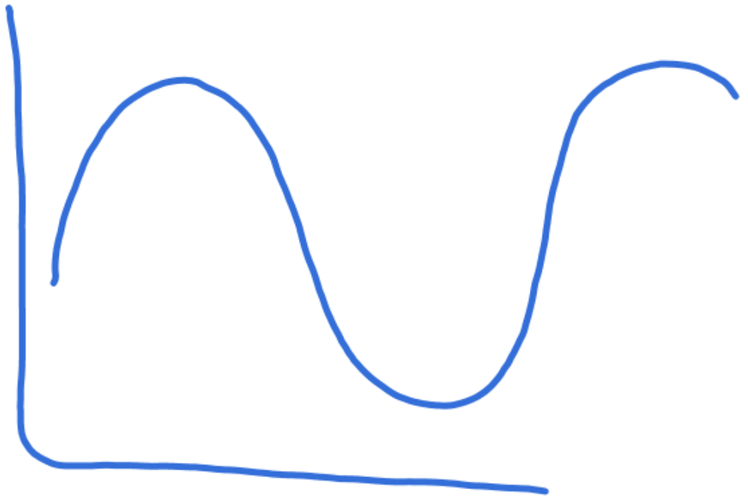
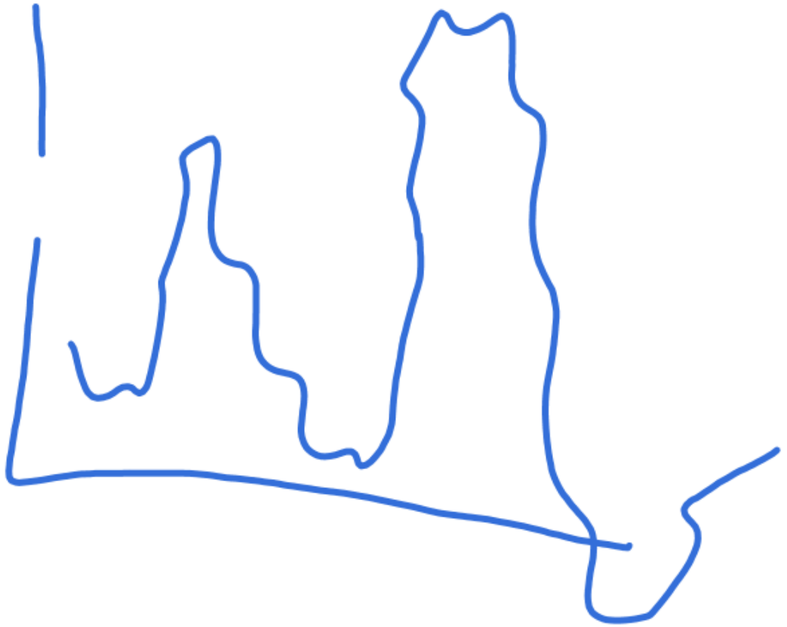
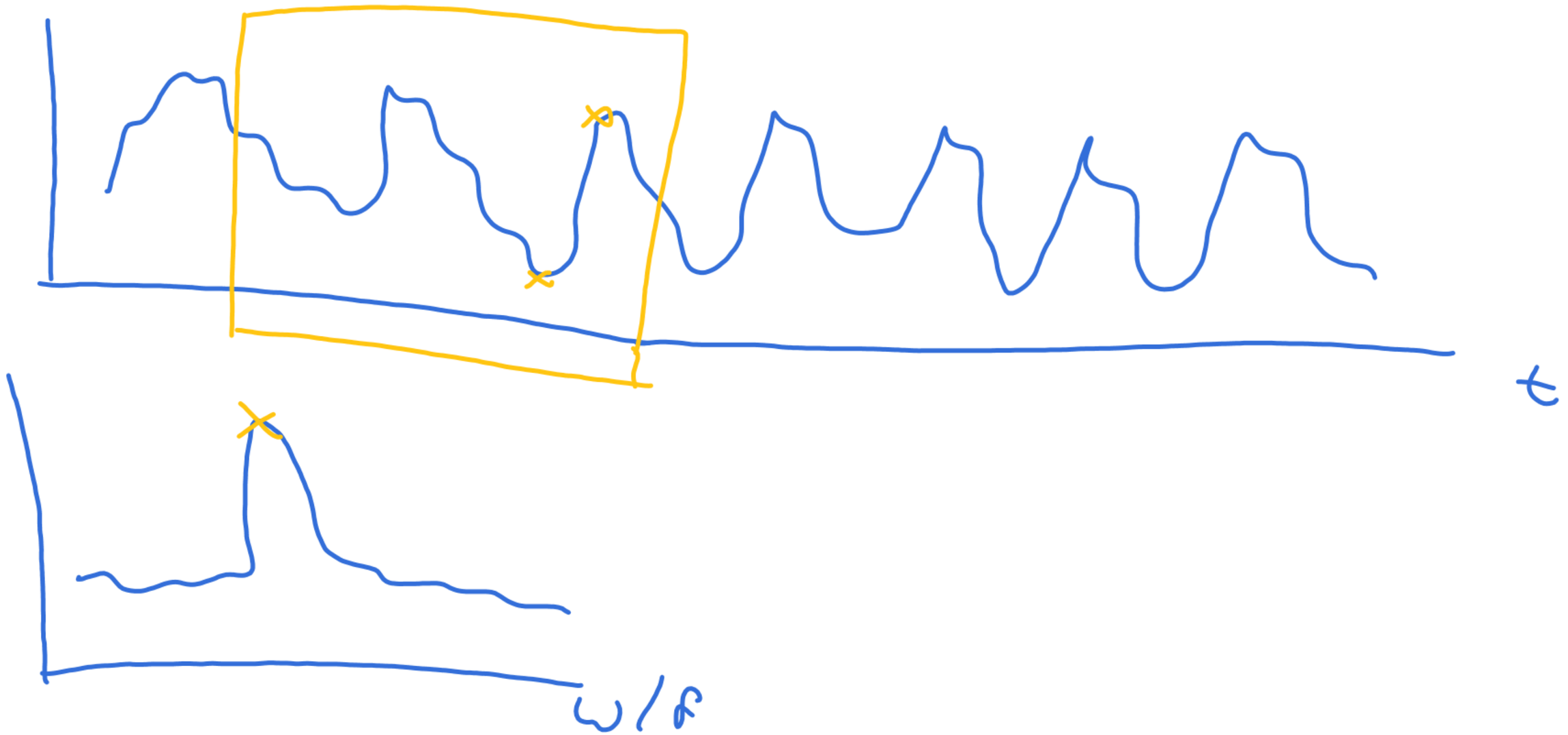
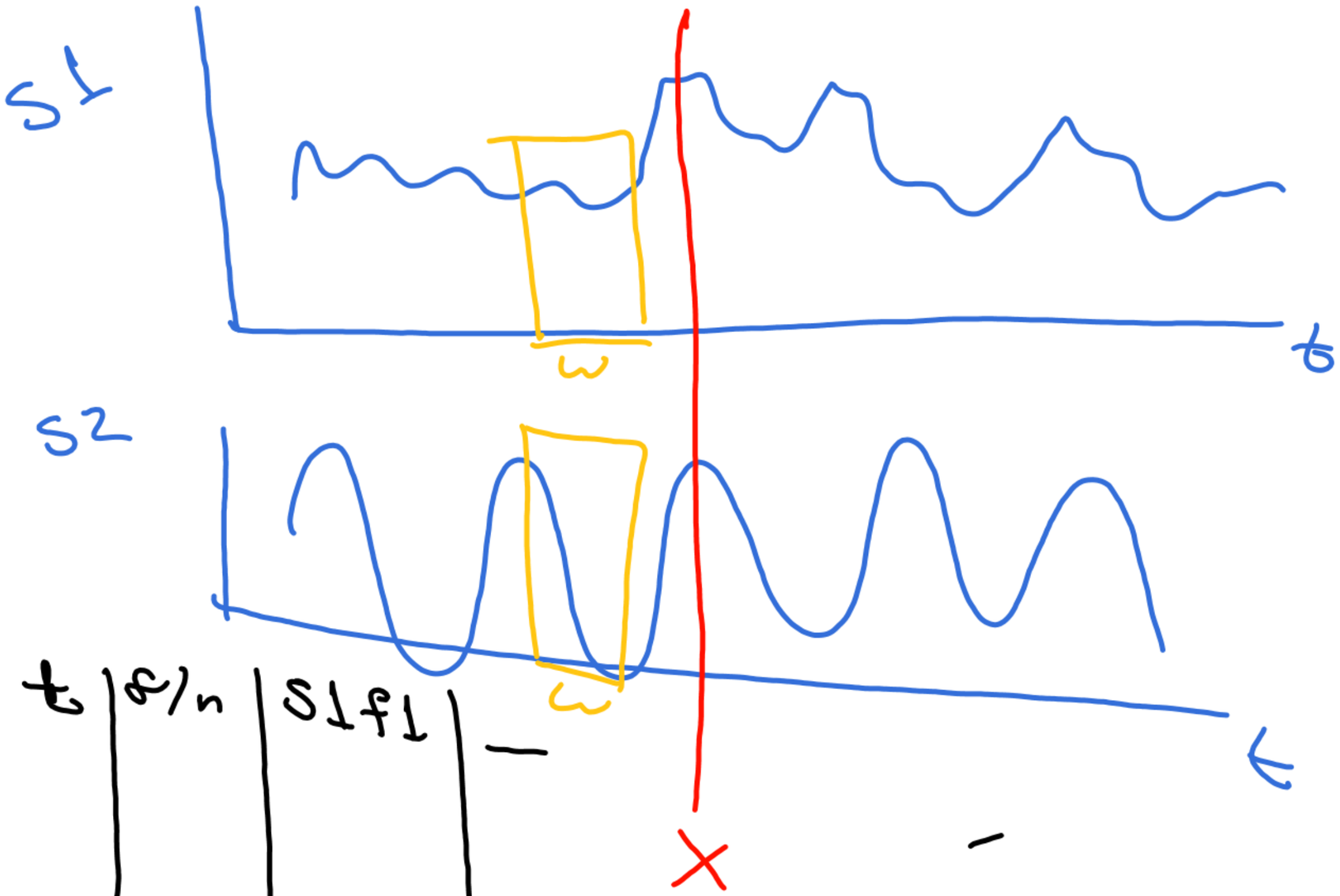
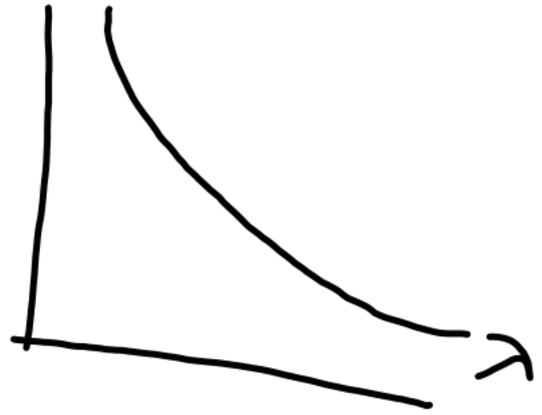
Independence of features

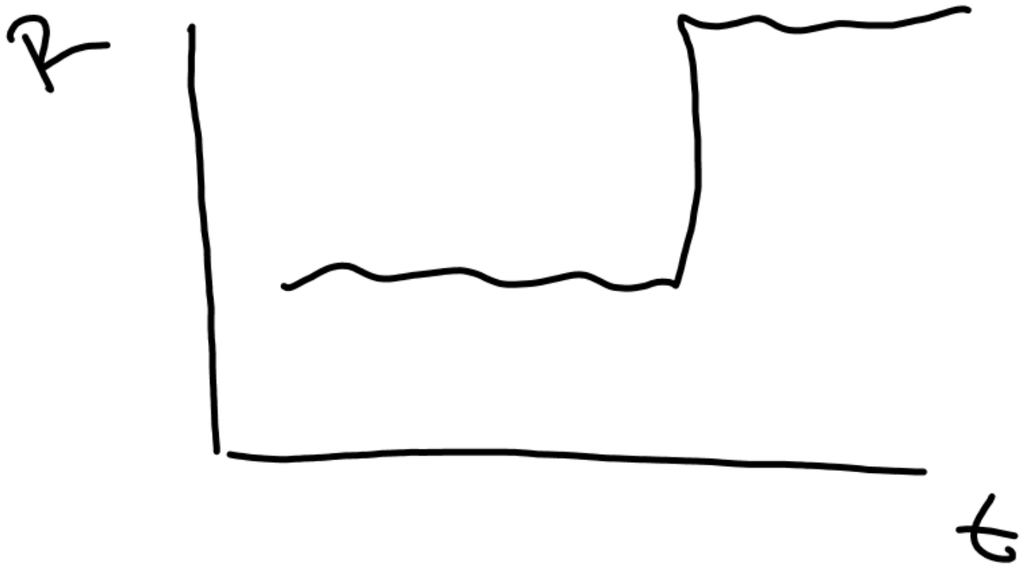





t
ω/s


S1
t
w
S2
w
t
X




P
t

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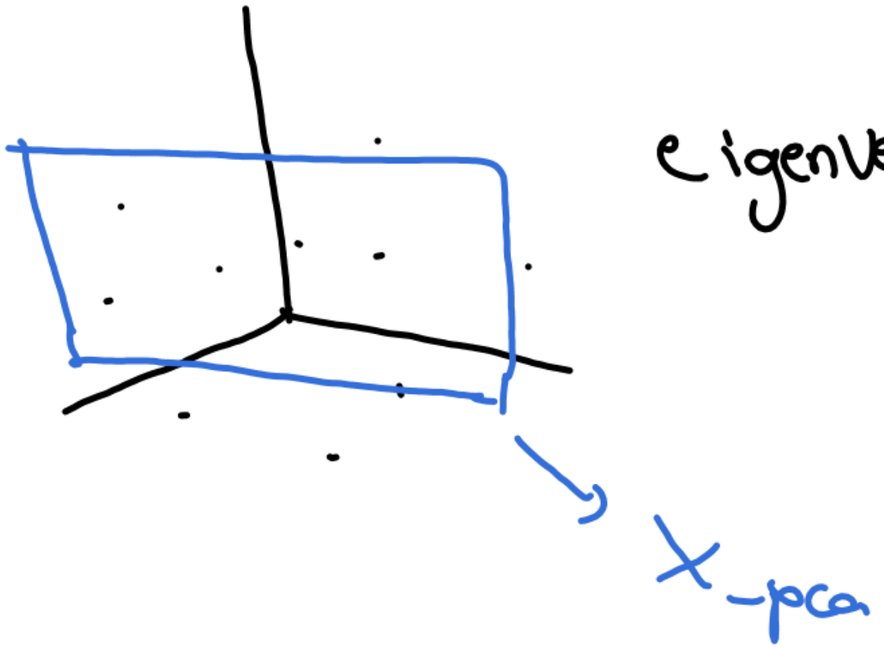
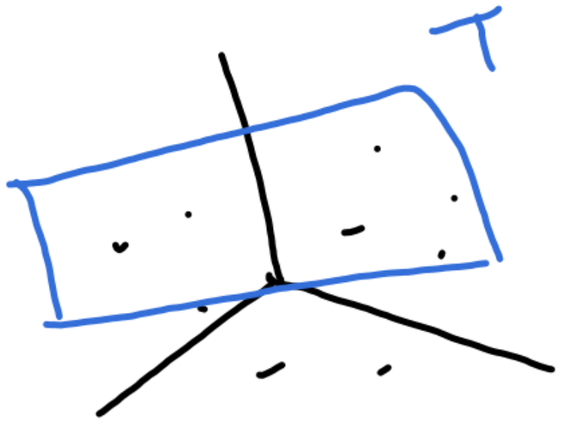
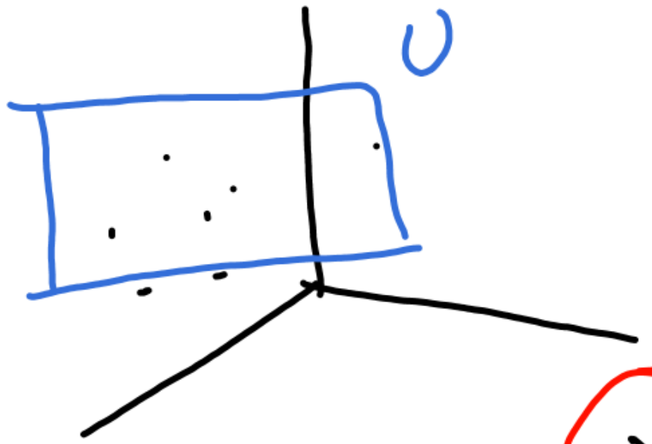
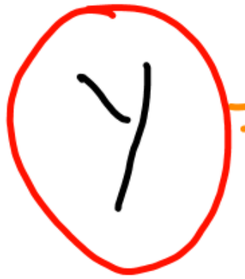


$$X_{\text{-pca}}$$

PLS







=> Y can be matrix

X

* Find T, U such that

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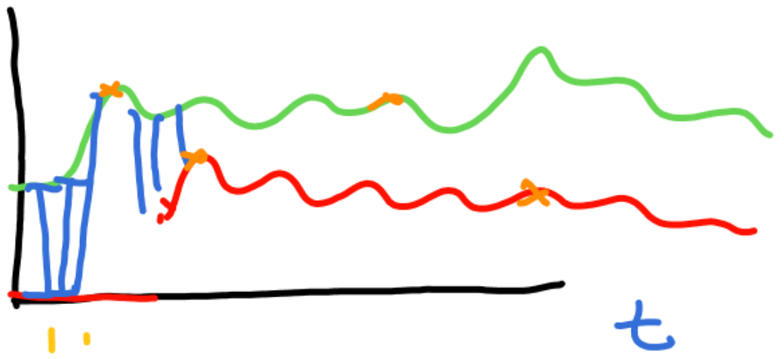
$cov(T,T) \cdot cov(U,U) \cdot \underline{cov(T,U)}$

How to compare time series?



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- Shifts

manually ✗

-

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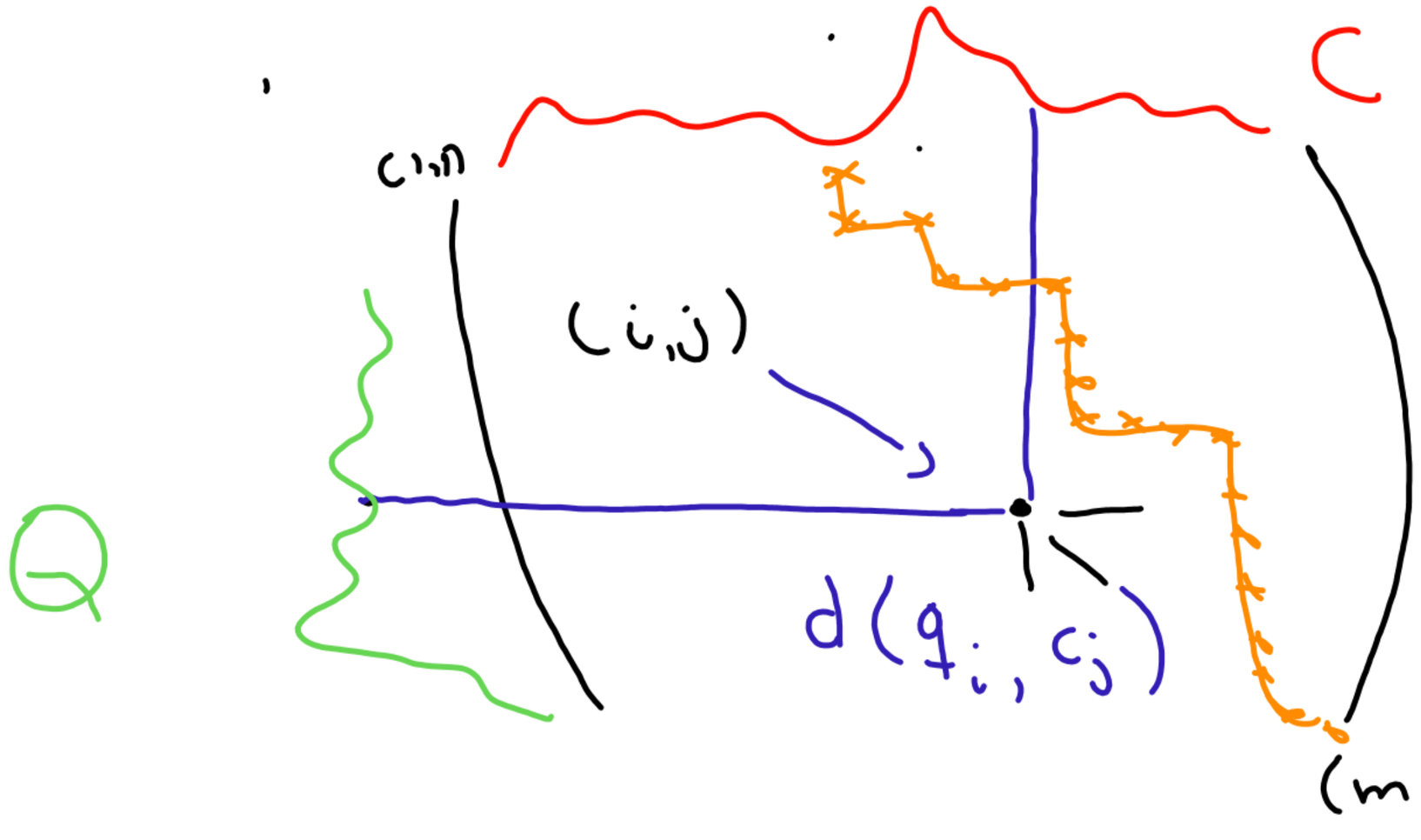

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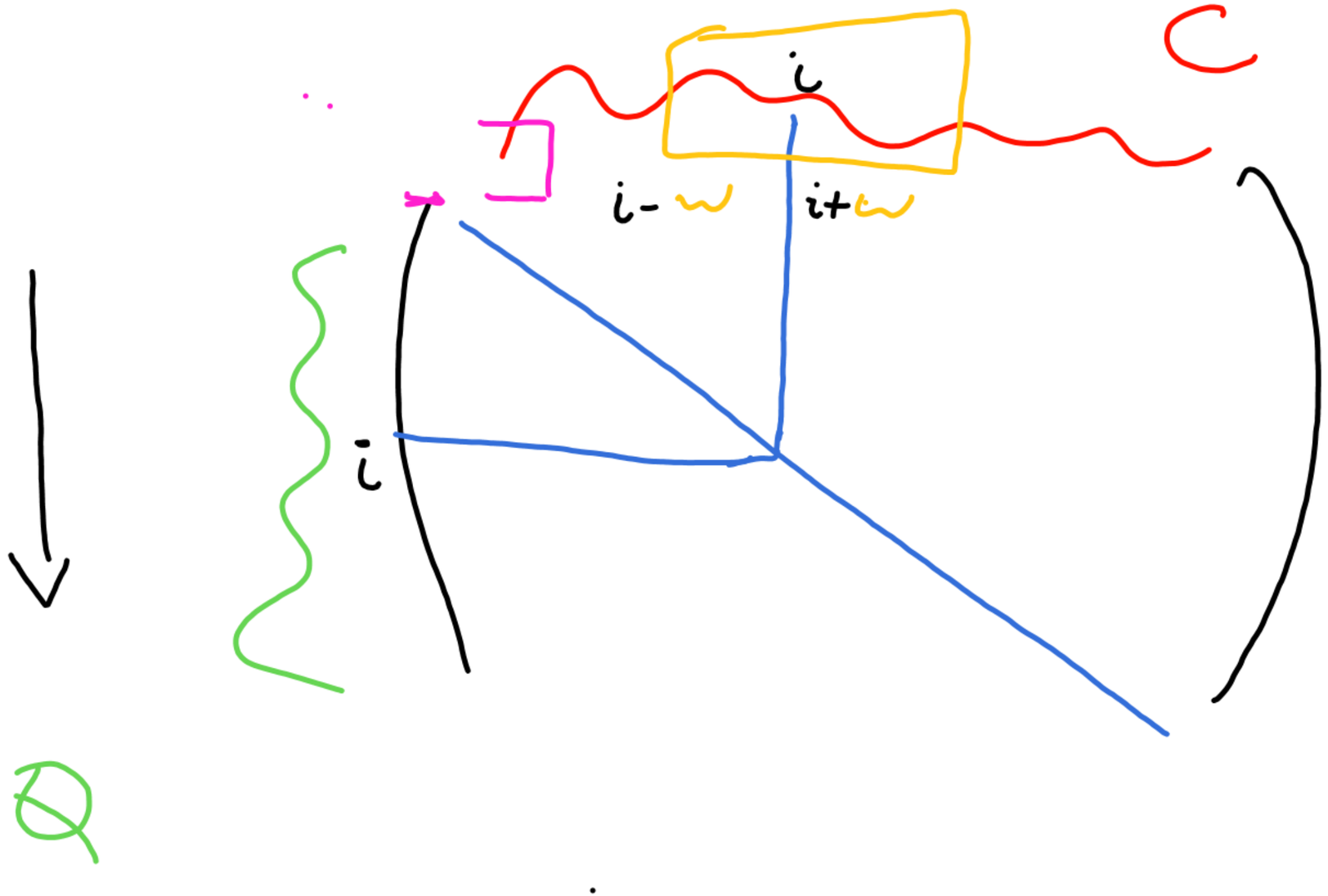
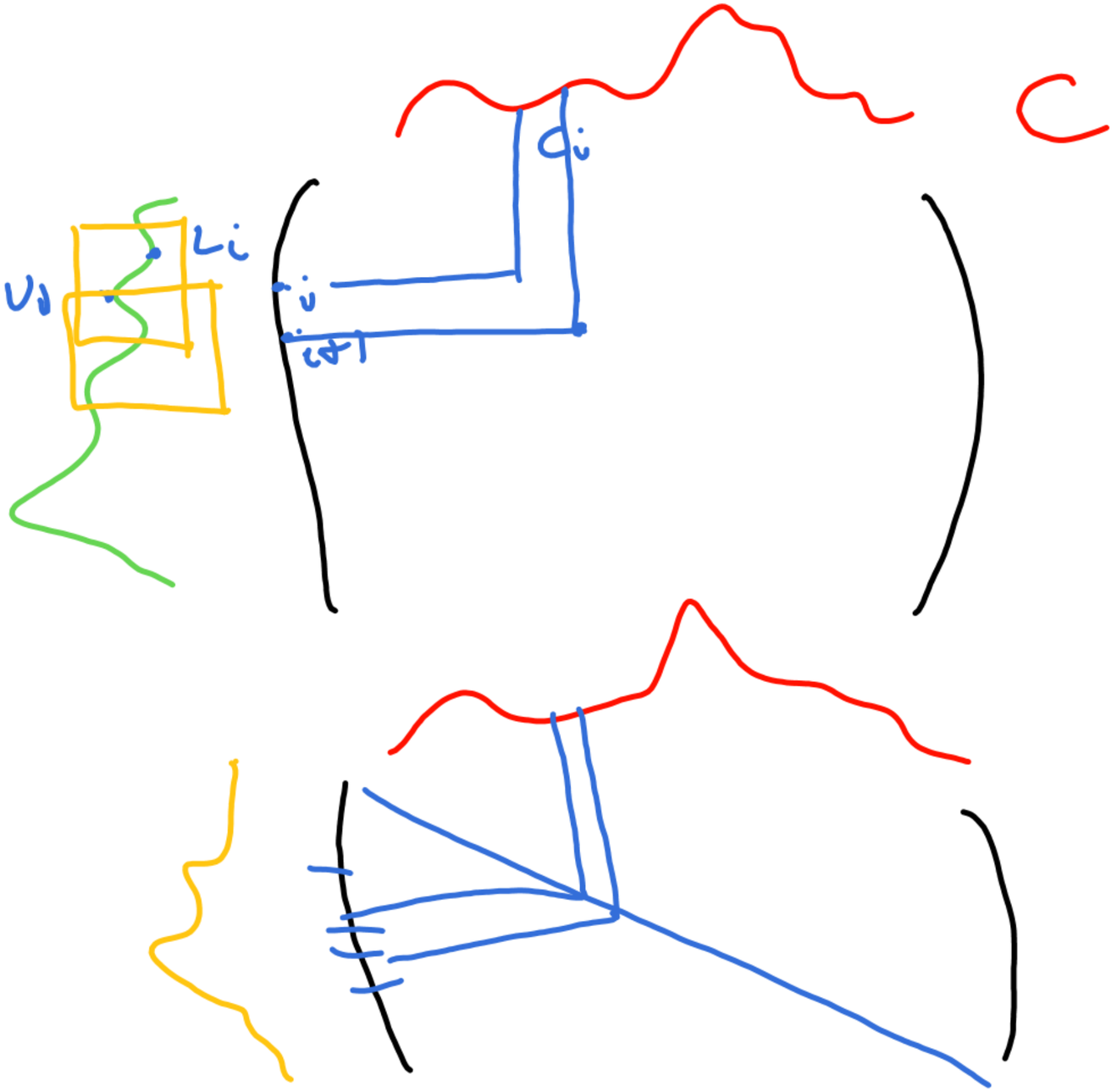

i
C
i-ω
i+ω
i
Q


C
Q

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$$+ \min \{ DTW(q_i, c_{j+1}),$$

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$$e$$