Lecture 23

Curve fitting

Curve fitting

t_1, t_2, t_3

$\bar{y}(t_n)$
$y_2(t_i)$
$y_2(t_i)$
$y_1(t_i)$
t_i t_n

$\bar{y}$

t_n

force = Y

f
$\bar{f}$

x = change in length

interpolation

T_0
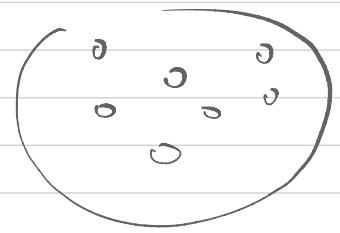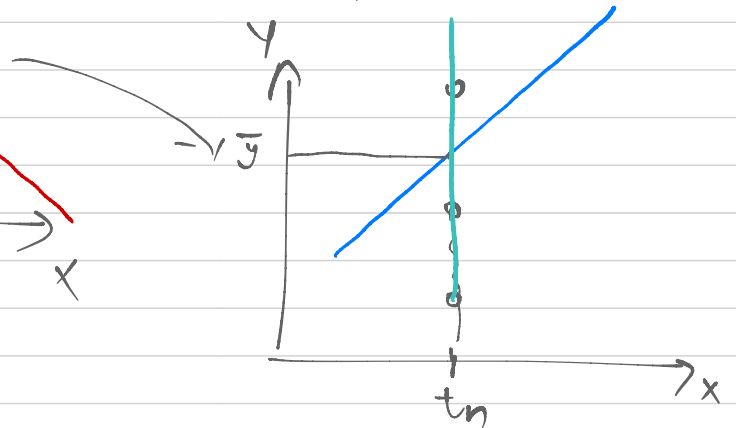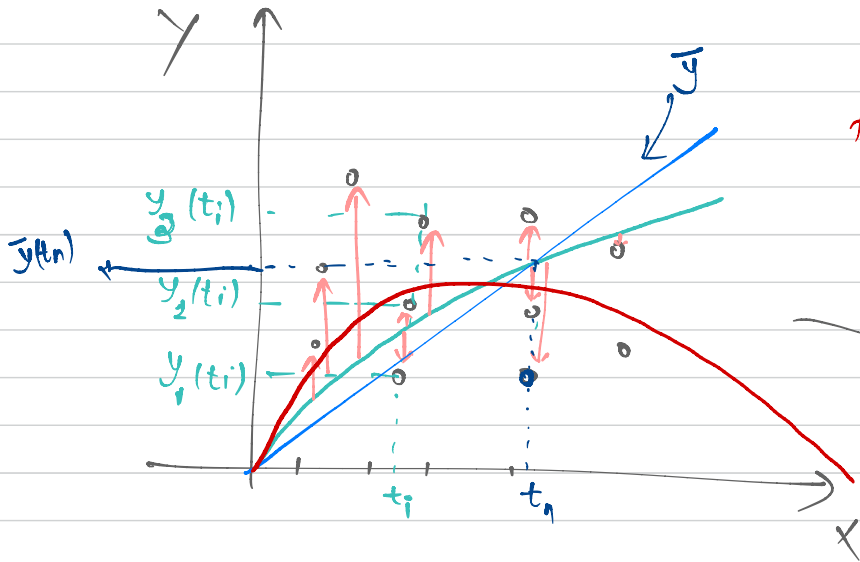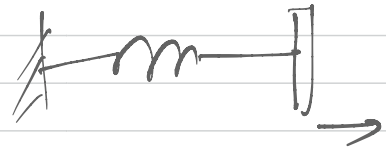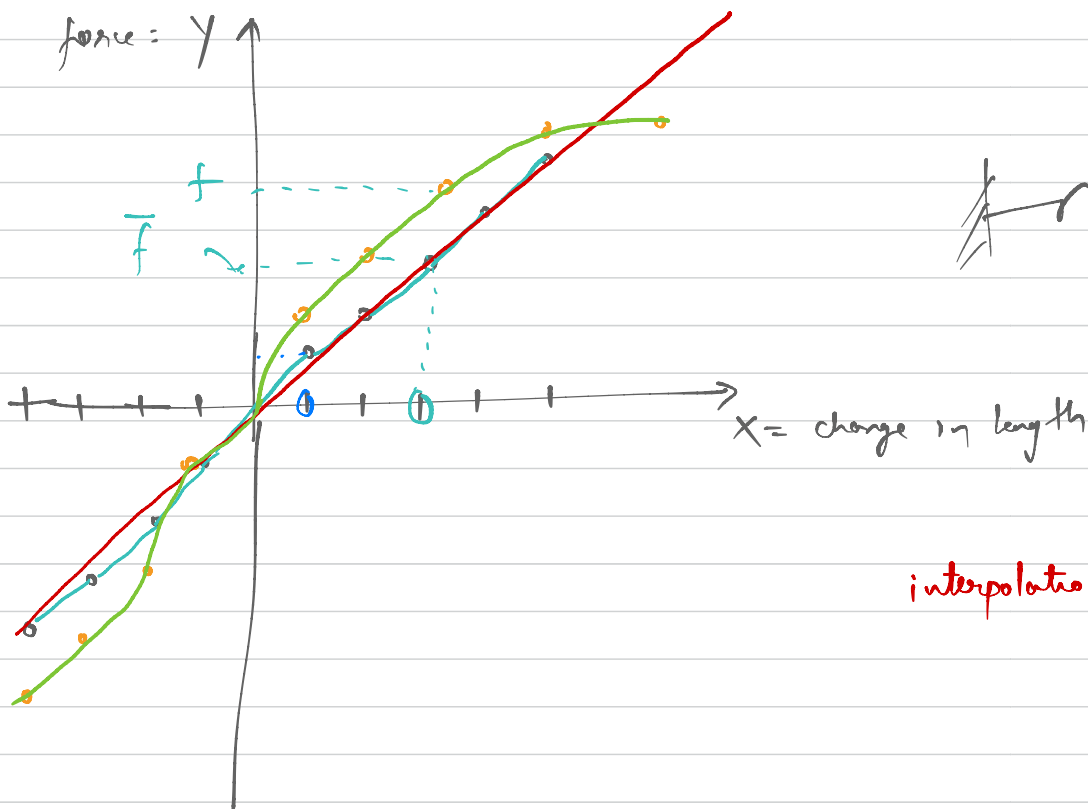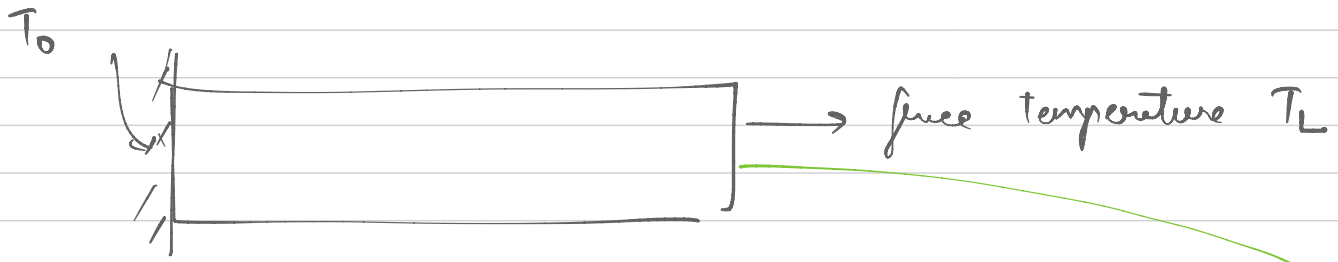
→ free temperature T_L

temperature at right end

$$-ka\frac{d^2T}{dx^2} = q_{ent} \longrightarrow 0 \le X \le L$$

$$Ax = b \quad , \quad h = 10^{-5} \, m$$

→ 10^5 element vector

$T_L = y$

→ "surrogate model"

$T_L^{(s)}$

$x = $ change in length

interpolation

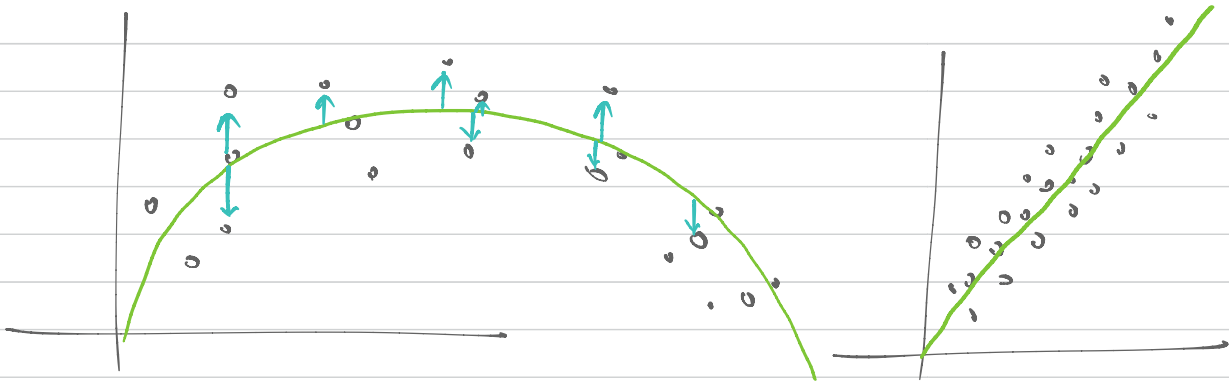evaluating curve at outside of experimental points is called extrapolation
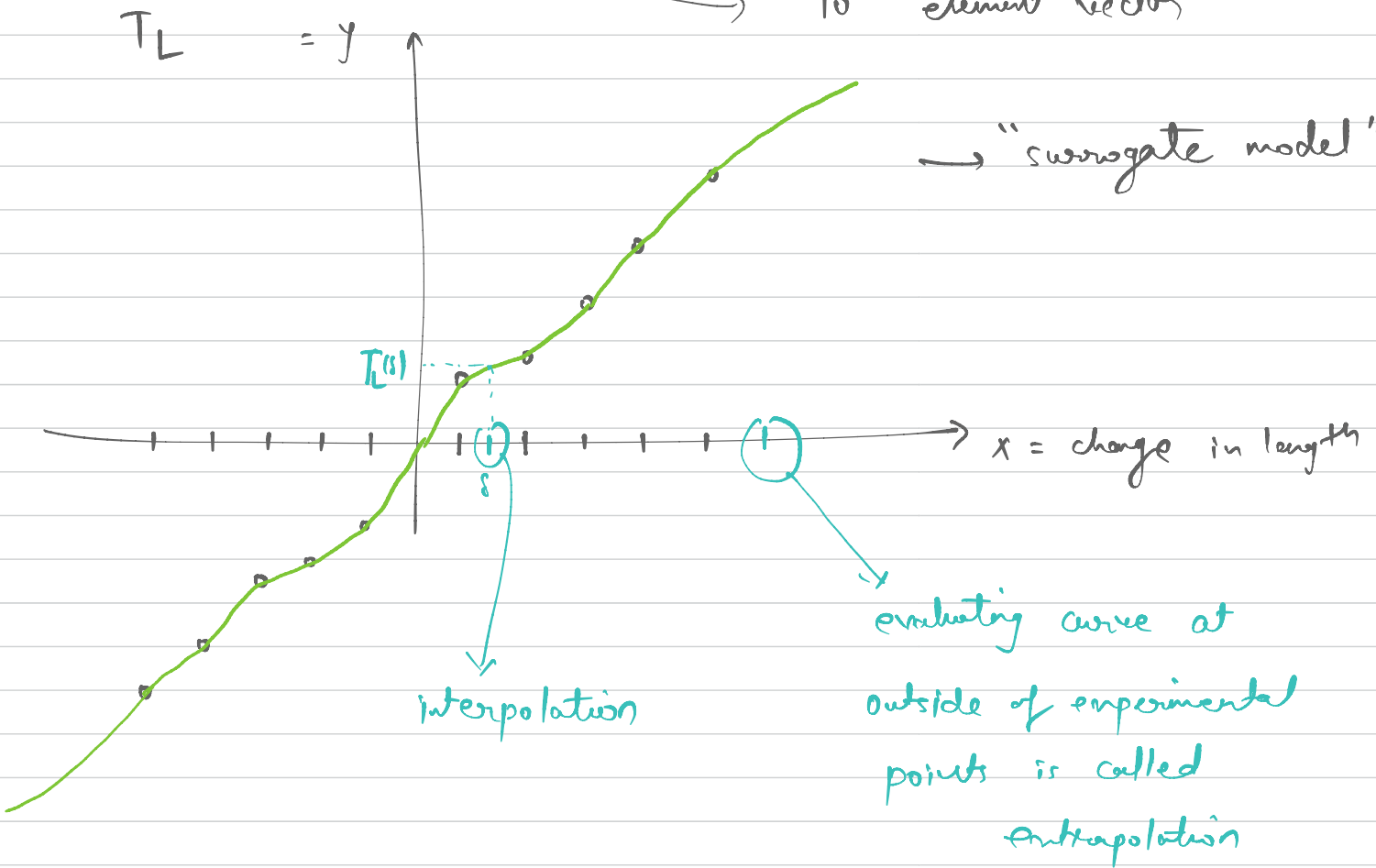
Methods for curve filling

- <u>Least square method</u>

  $\rightarrow$ need to fine type curve

  linear? quadratic, cubic, ..exp..;

$$y(x) = a_0 + a_1 x + a_2 x^2$$

$\downarrow$

| The value of a_0, a_1, a_2 | $\leftarrow$ deterministic

- Monte-Carlo based methods $\quad \leftarrow \quad$ <u>stochastic</u>

  probability distribution of $\quad a_0, a_1, a_2$

  $\downarrow$

  range of a_0, a_1, a_2 values

probability density function (pdf)
of a_1

y

pdf of a_2

$x = a_2$
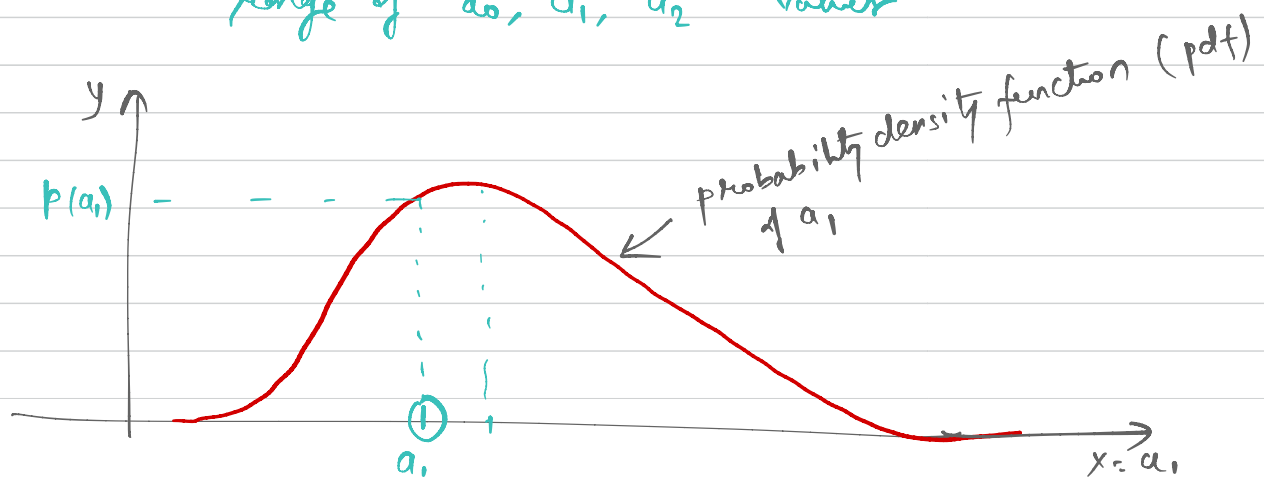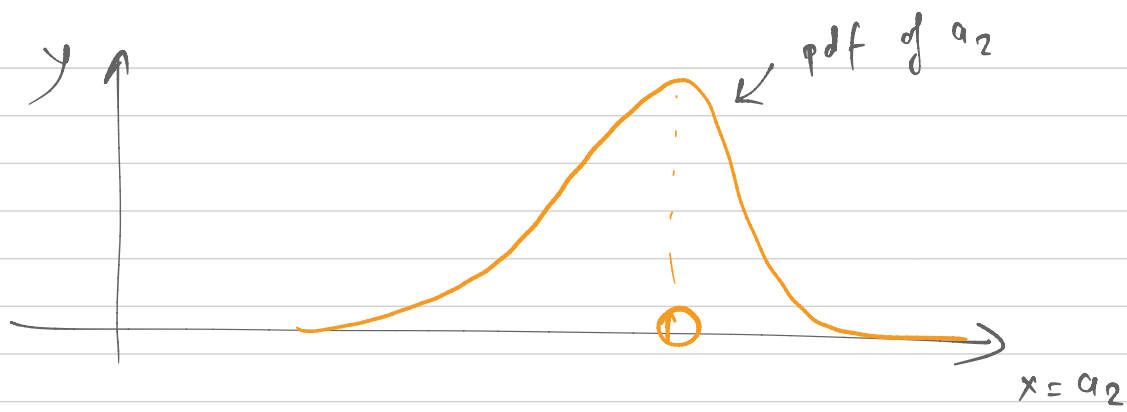
○ Neural Network for curve filling