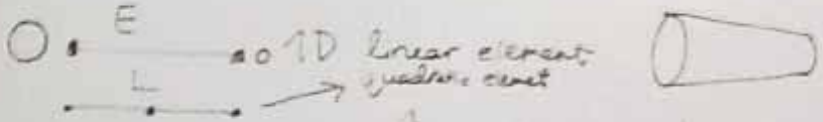
$M\ddot{U} + KU = F$



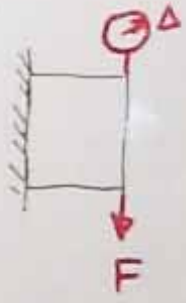
$$\frac{EA}{L}\begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}\begin{Bmatrix} u_1 \\ u_2 \end{Bmatrix} = \begin{Bmatrix} F_1 \\ F_2 \end{Bmatrix}$$

$A \quad x = b$

unknown

B.C.

Governing Equation / Constitutive Eq^n

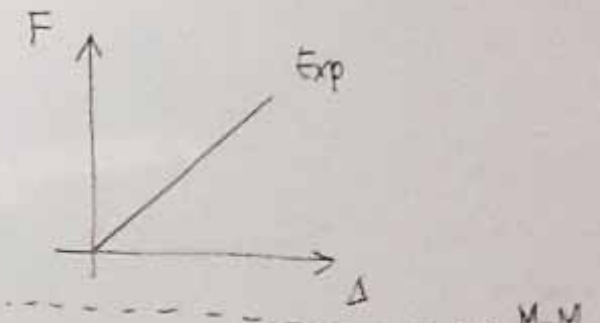


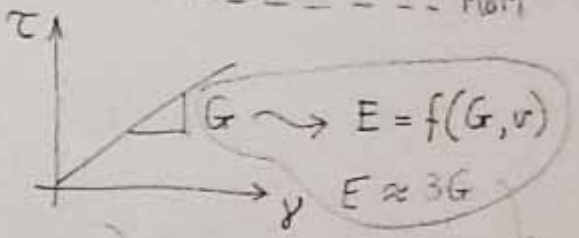
$x = A^{-1}b$

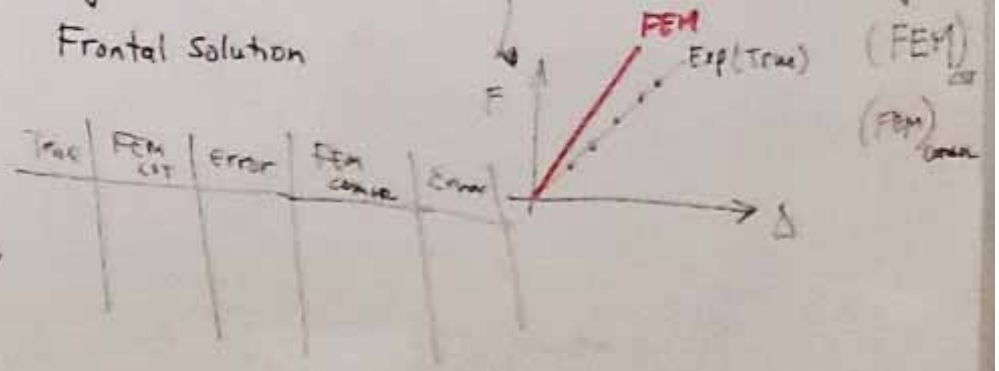
Gauss Elim^n

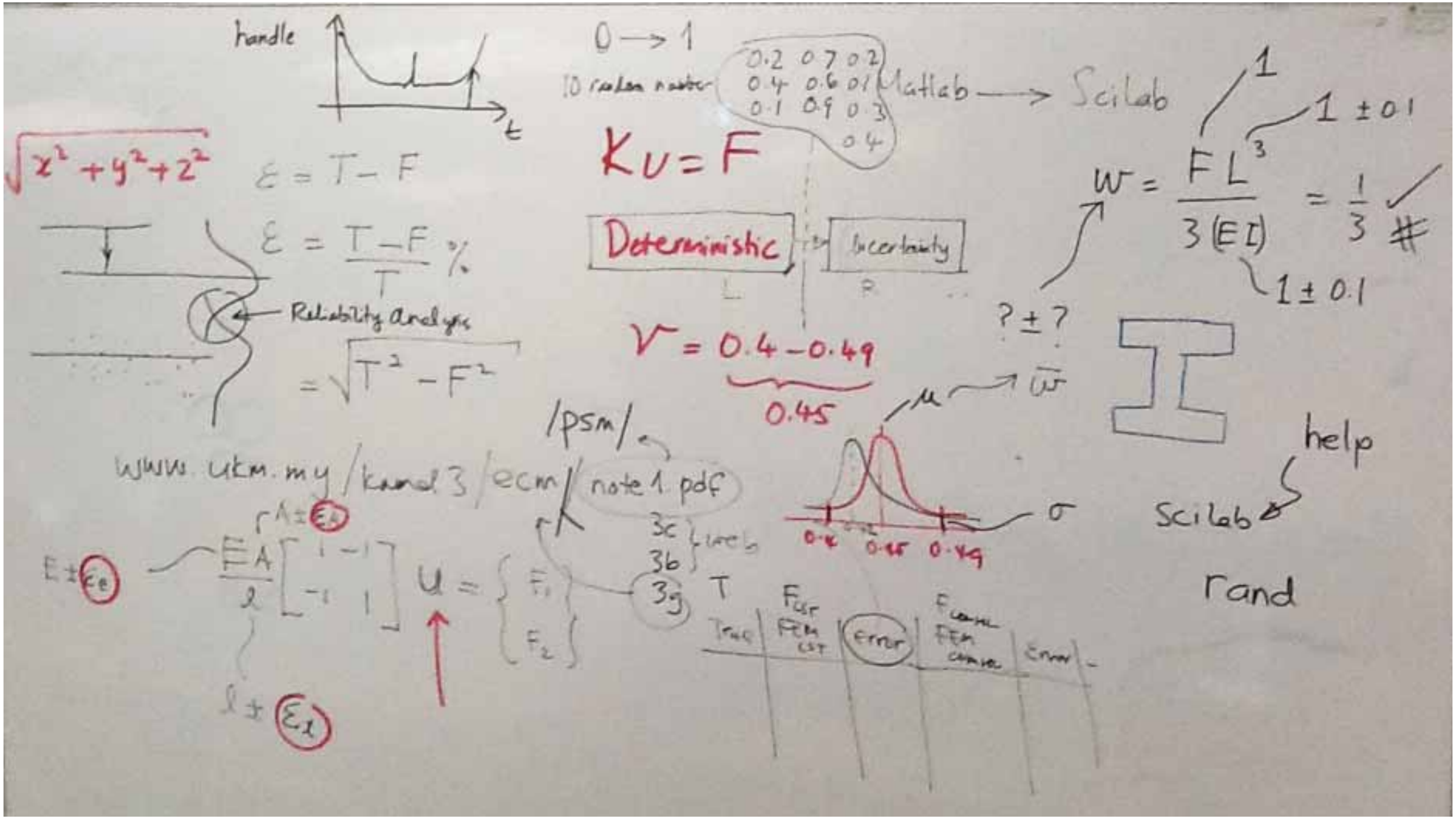
⋮

Frontal Solution








handle
t
0 → 1
10 random number
0.2 0.7 0.2
0.4 0.6 0.1
0.1 0.9 0.3
0.4
Matlab → Scilab
Ku = F
ε = T − F
ε = (T − F)/T %
Reliability analysis
= √(T² − F²)
Deterministic
Uncertainty
v = 0.4 − 0.49
0.45
/psm/
www.ukm.my/kamal3/ecm/note1.pdf
3c
3b
3g
web
μ
σ
0.4
0.45
0.49
?±?
w = FL³/3(EI) = 1/3
1
1 ± 0.1
1 ± 0.1
help
Scilab
rand
T
True
F
FEM
Error

2T 2000G

I_c

RM400 + wifi Cloud

Deterministic

Analytical

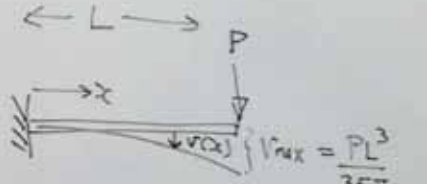
$$v(x) = -\frac{Px^2}{6EI}(3L - x)$$

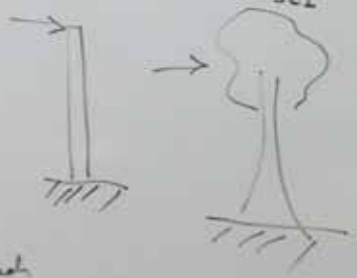
Finite Element

Uncertainty

Approach

- Probabilistic (Monte Carlo Analysis)
- Non Probabilistic (Fuzzy Analysis)
- Stochastic Approach





Submission

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> 2G cloud

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file name P11720 name Assignment II

dropbox 5G

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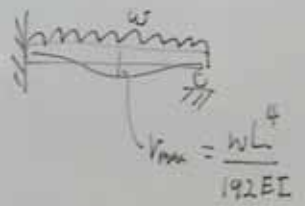
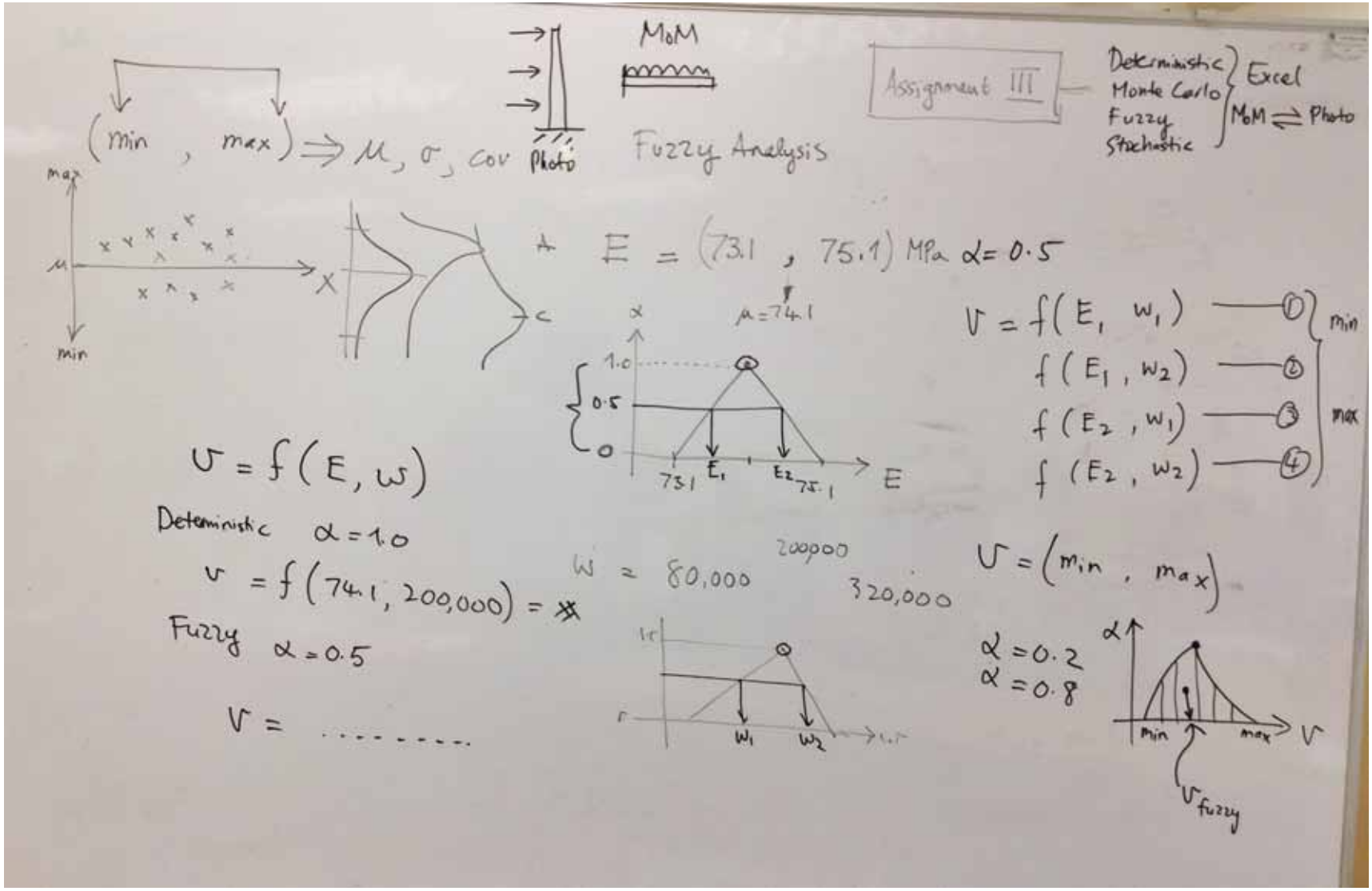
box 5G

15G




MoM
Assignment III
Deterministic
Monte Carlo
Fuzzy
Stochastic
Excel
MoM ⇌ Photo
(min , max) ⇒ μ, σ, cov
Photo
Fuzzy Analysis
max
μ
X
min
A
E = (73.1 , 75.1) MPa α = 0.5
μ = 74.1
α
1.0
0.5
0
73.1
E1
E2
75.1
E
V = f(E, w)
Deterministic α = 1.0
v = f(74.1, 200,000) = #
Fuzzy α = 0.5
V = ...
W = 80,000
200000
320,000
W1
W2
V = f(E1 , w1) ①
f(E1 , w2) ②
f(E2 , w1) ③
f(E2 , w2) ④
min
max
V = (min , max)
α = 0.2
α = 0.8
α
min
max
V
Vfuzzy