$x = \begin{pmatrix} u_c \\ T \end{pmatrix}$

SIM.

INPUTS: x_0, u_c, T, N

OUTPUTS: $x_1, \dots, x_N$

for $i = 0, \dots, N-1$:

$x_{i+1} = x_i + \frac{T}{N} f(x_i, u_i)$

GAUSS-NEWTON

$\min_{x \in \mathbb{R}^2} \|F(x)\|_2^2$

$\|v\|_2^2 = v^T v$

$F(x) := \begin{bmatrix} x_N^{[1]} \\ \vdots \\ x_N^{[4]} \end{bmatrix}$

$obj = \left\| x_N - \begin{pmatrix} 1/2 \\ 1/2 \\ 1/2 \\ 1/2 \end{pmatrix} \right\|_2^2$

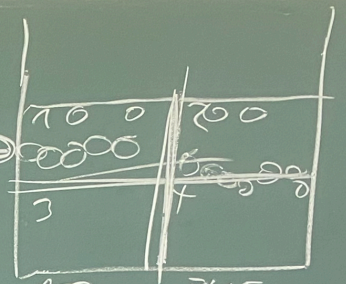
$= (x_N^{[1]} - \frac{1}{2})^2 + (x_N^{[2]} - \frac{1}{2})^2 + (x_N^{[3]} - \frac{1}{2})^2 + (x_N^{[4]} - \frac{1}{2})^2$

$x(t) = \begin{pmatrix} x^{[1]}(t) \\ x^{[2]}(t) \\ x^{[3]}(t) \\ x^{[4]}(t) \end{pmatrix}$

$x_0 = \begin{pmatrix} 0 \\ 1 \\ 0 \\ 1 \end{pmatrix}$

$\dot{x}(t) = f(x, u)$

$u(t) = u_{const.}$



REAL-WORLD PROCESS

PARTICLE SIMULATIONS

FOKKER-PLANCK EQ.

MACRO-SCALE MODEL

SIMULATION MODEL

PARTIAL D.E.

& COMPARTMENT MODELS

ORDINARY D.E. (ODE)