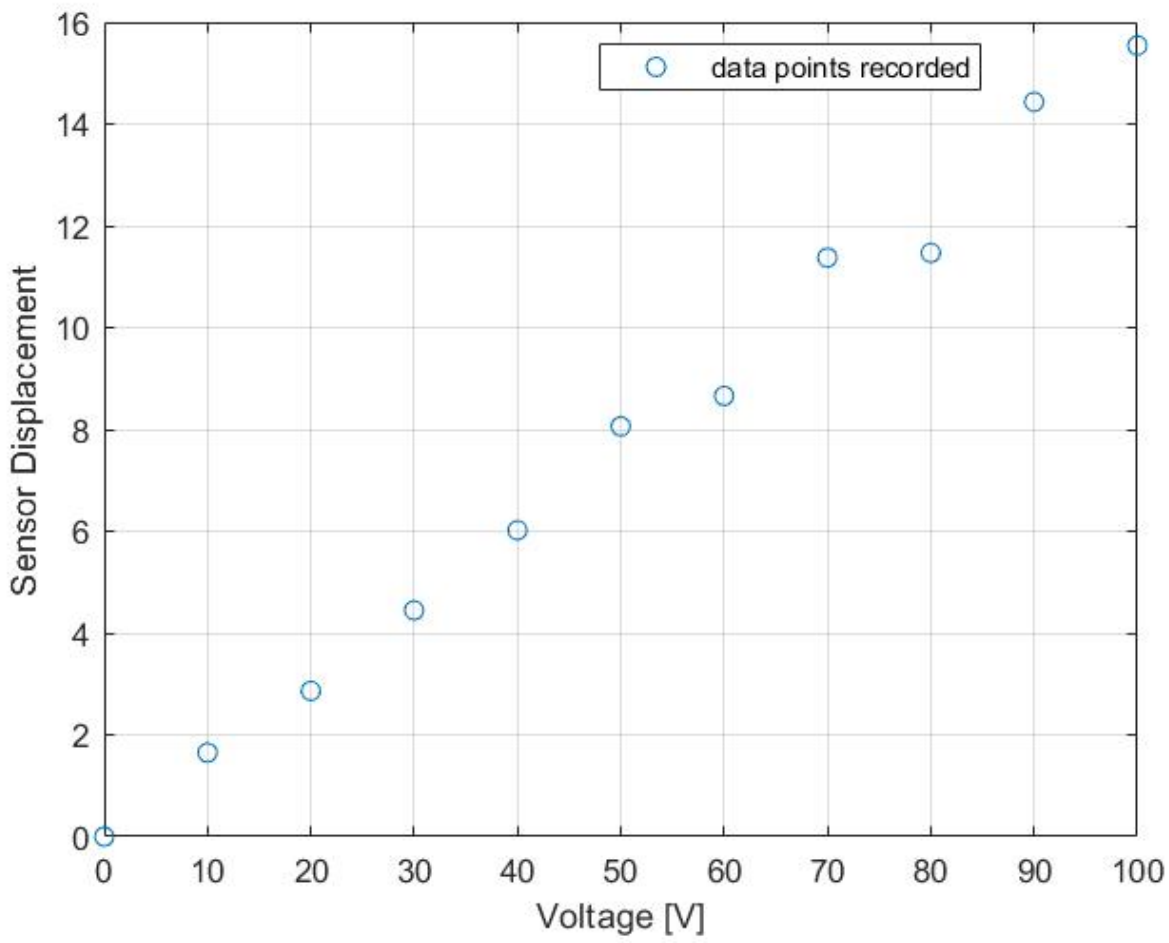
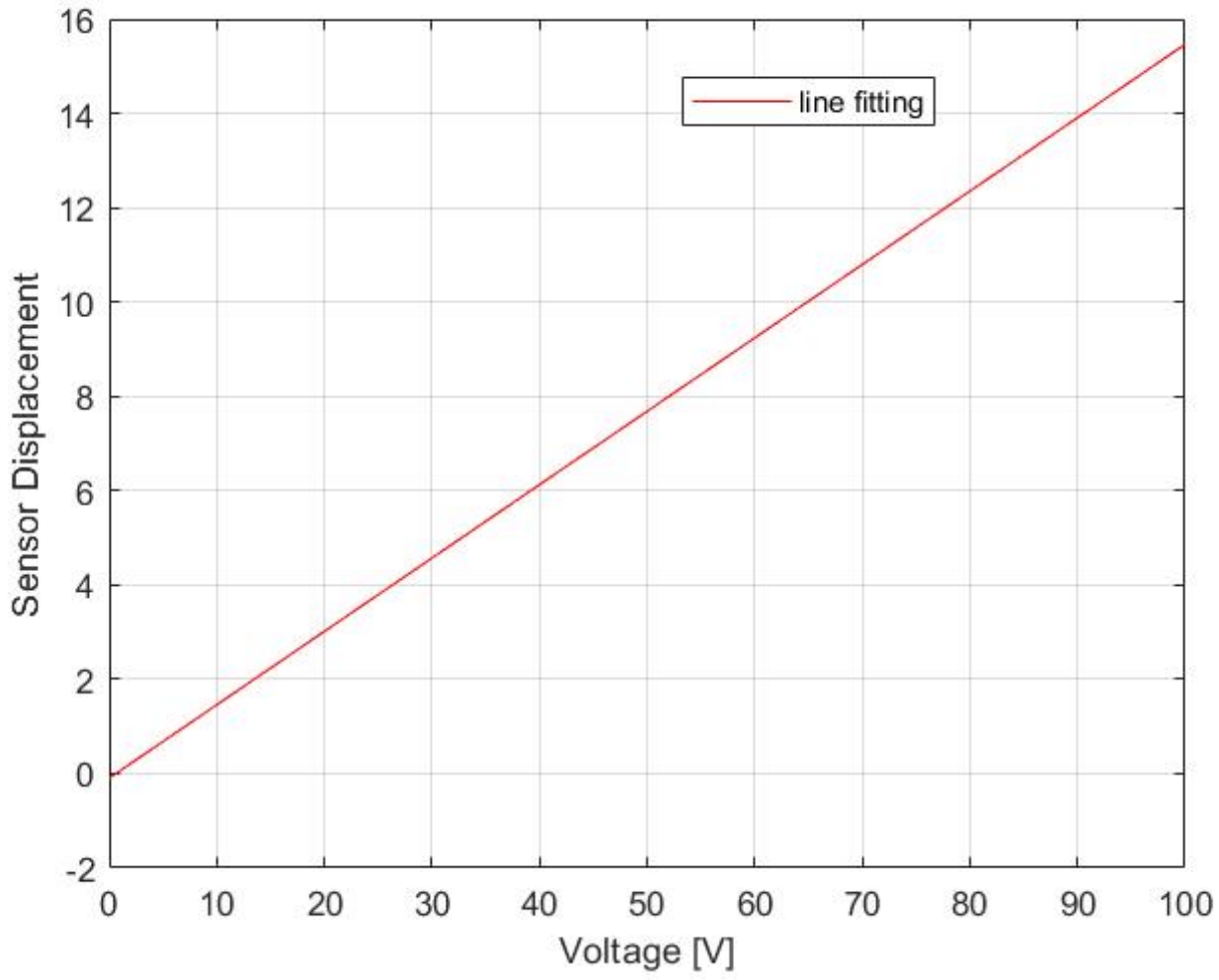
Exercise 1

a) $G = 0.1556 \ \mu m / V$

b) Plot of data points



c) Plot of fitted function for $v \in [0, 100]$

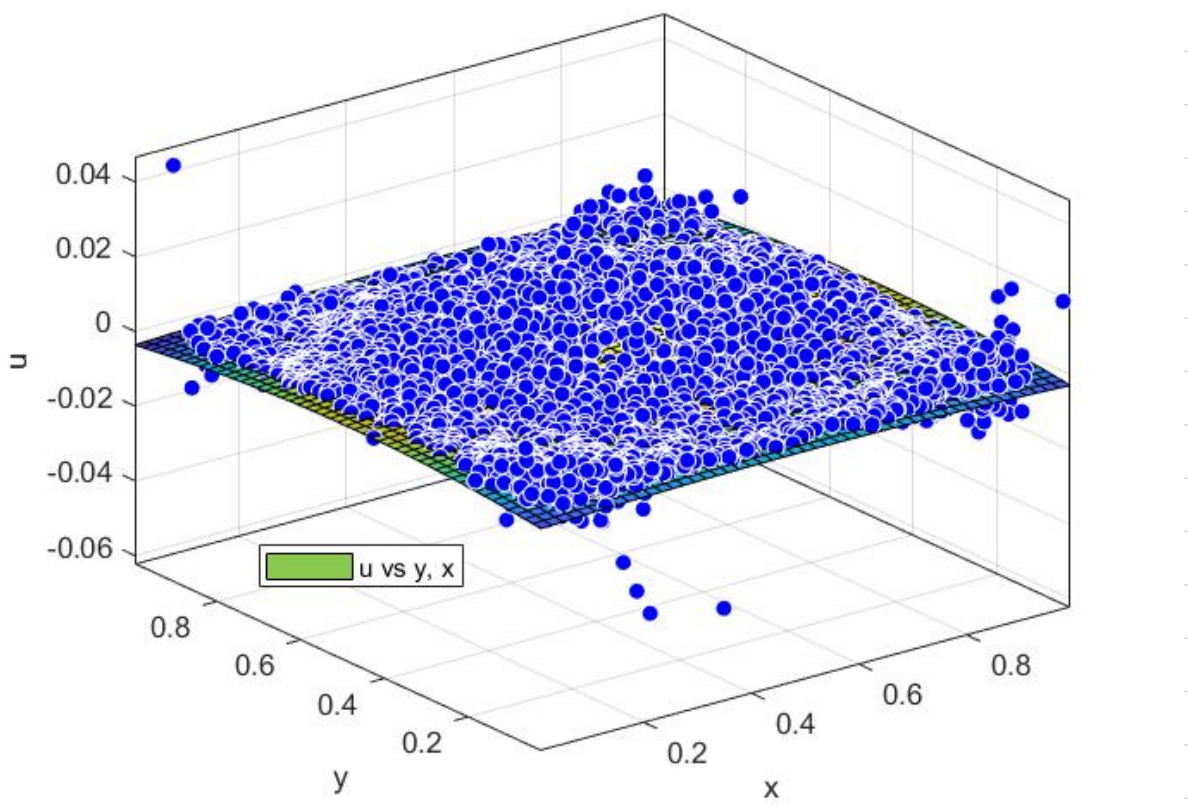


d) Estimation of d when the voltage is 75 V.

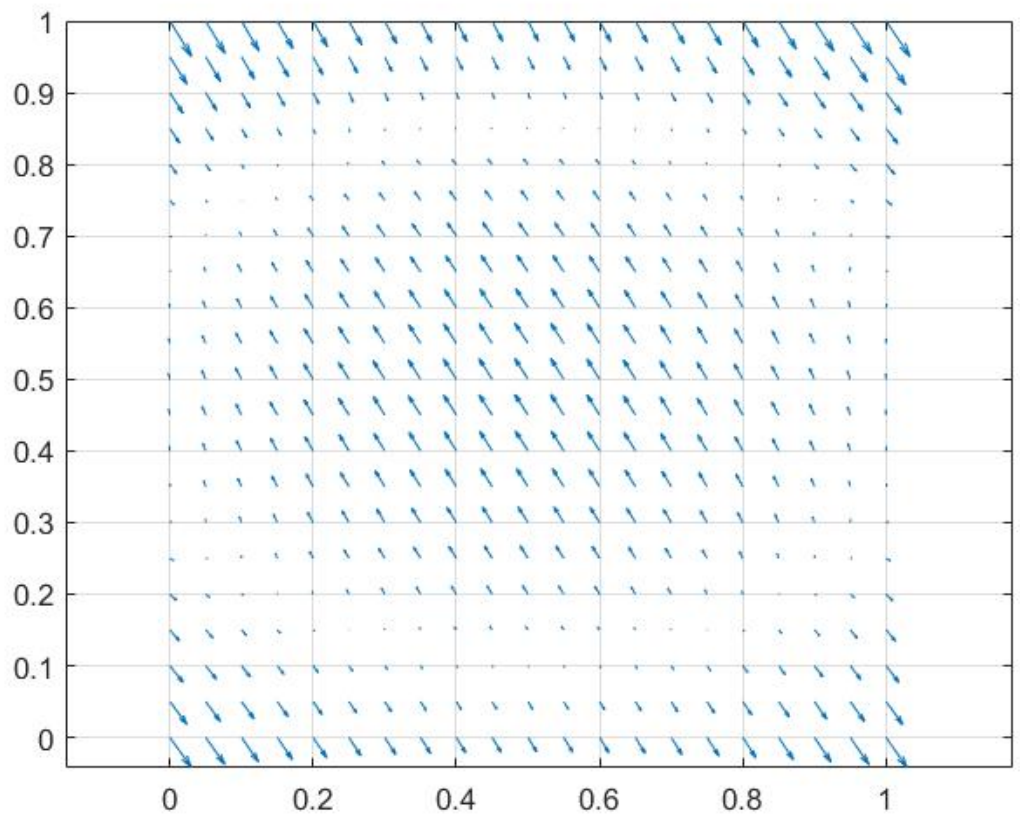
$d = 11.5731$

Exercise 2

a)



b)



3)

a) $y = k_1 x^{k_2} \Rightarrow \ln(y) = \ln(k_1) + k_2 \ln(x)$

b) SSE training = 1969.6 R^2 for training = 0.967

SSE validation = 191.3184

c) After testing for a 1st, 2nd and 3rd degree polynomial it can be seen that as the polynomial degree increases, also the SSE does. Therefore the best option is to choose a first degree polynomial, as it had the lowest SSE value (145.425)

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Exercise 4

a) see Matlab script

b) see Matlab script

c)