

V & V

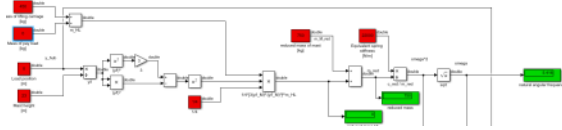
Tuesday, February 2, 2021 12:08 PM

Verification -> Is the conceptual model implemented correctly? Does the conceptual model correspond to the implemented model?

Validation -> Is the model suitable for providing useful statements?

a) Lifting carriage lowest position, no load

0 pay load, 0 load position : 750 reduced mass, 5.416 natural angular frequency



b) Lifting carriage lowest position, maximum load

560 pay load, 0 load position : 750 reduced mass, 5.416 natural angular frequency [same as a)]

c) Lifting carriage highest position, no load

0 pay load, 23 load position : 1200 reduced mass, 4.282 natural angular frequency ; 450 reduced mass HL

d) Lifting carriage highest position, maximum load

560 pay load, 23 load position : 1760 reduced mass, 3.536 natural angular frequency ; 1010 reduced mass HL

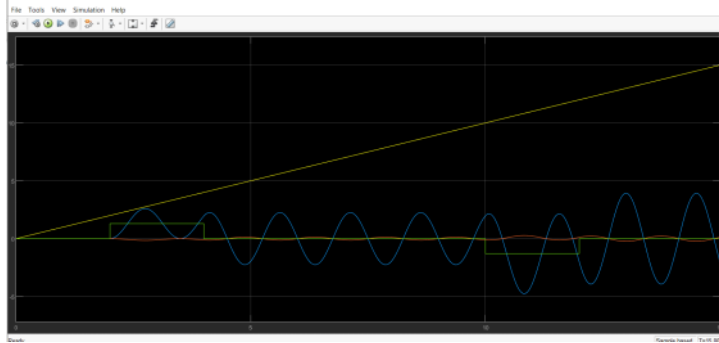
e) Self testing: load:200, height 20, w in simulink is 4.429. Calculated in matlab is 4.333

f) Self testing: load:150 height:16, w in simulink is ...

xlswrite('testdata.xlsx',w)

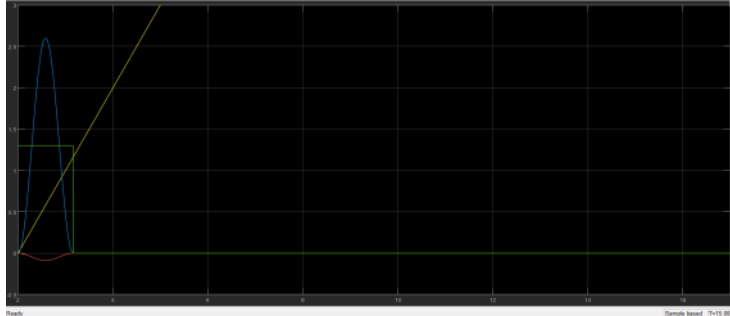
Test 1

T1:step = 2 ; T2:step=4 ; T3:step = 10; T4:Step = 12



Test 2

Edited the time delay to 2



Test 3

Change the excitation(gain) to 0.7

Edited the time delay to 2



Test 4

T1:step = 2 ; T2:step=4 ; T3:step = 15; T4:Step = 17

Questions asked

What was done for the first question?

Ans: cross reference the coded matlab calculated values of w to the value in simulink. Tested not only extreme values(means: given values) but also intermediate values.

Why did you calculated the intermediate values too?

Ans: The given extreme values would only lead to 1 - 1 or 0. The $(y/l)^3$ and $(y/l)^2$, the power of 3 and power of 2 does not affect the values of 1 and 0. Therefore it would make sense to test out the values that would be affected by the, power of 2 or 3.

Definition of verification?

Ans: Answering the question, "Is the conceptual model modeled correctly?"

How did you "verify" in this model?

Ans: we compare it to actual values

What other methods can be used to verify this model?

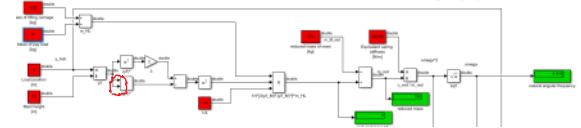
Ans: animation, debug mode or formal proof

Is the given model correct?

Ans: No, the calculated values in matlab(self coded) and the value in simulink are different

What must be changed in the model?

Ans: add another input here(red colored circle)



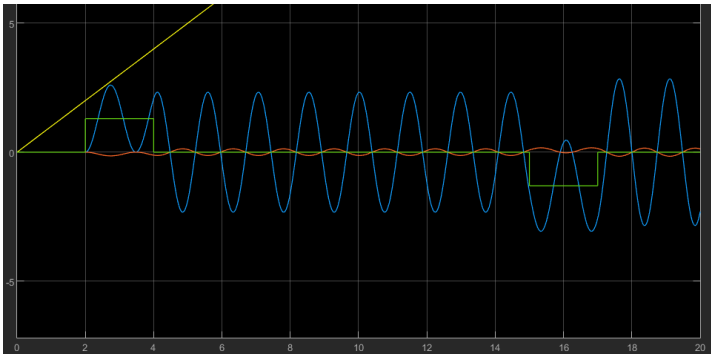
Explain what you did for question 2

What is this model useful for?(he was referring to our input graphs with "perfect" excitations)

Ans: In our graph we only have excitations from the time 0 to approx 2. This model is only valid for short term excitation and not long term. This is useful when you are creating a control system.

When is this model not useful?

Ans: When you are dimensioning the components of a machine. You are unable to determine the fatigue areas of the machinery due to the vibrations omitted.



Michael Dietzel: Beeinflussung des Schwingungsverhaltens von Regalbediengeräten durch Regelung des Fahrtriebs