**ALGORITHM (FUZZY CONTROLLER) DOCUMENTATION GUIDE**

Provide the required details using the following guide.

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| **Components** | **Details** | **Intructions** |
| Inputs | X = (**A** \* **theta**) + (**B** \* **theta\_dot**)  Y = (**C**\***x**) + (**D** \* **x\_dot**)   with  A=4.0  B=1.0  C=0.75  D=0.5 | Specify all the inputs, including the coefficients (constants). Note: This assignment requires implementing Yamakawa’s fuzzy controller design. |
| Fuzzy Rules | All 25 of Yamakawa’s method | Specify the fuzzy rules used in your system. |
| Fuzzy Membership functions | for X we have  a b c d  left trapazoid  -1.5, -1, 0, 0  triangle  -1.5, -0.8, -0.8, -0.1  triangle  -0.6, 0, 0, 0.6  triangle  0.1, 0.8, 0.8, 1.5  right trapazoid  1, 1.5, 0, 0  ----------------  For Y we have  left trapazoid  -1.5, -1, 0, 0  triangle  -1.5, -0.8, -0.8, -0.1  triangle  -0.6, 0, 0, 0.6  triangle  0.1, 0.8, 0.8, 1.5  right trapazoid  1, 1.5, 0, 0 | Specify the parameters of all membership functions used for each of the inputs. (e.g. input, type, fuzzy set name, a=?, b=?, c=?, d=?)  Use the Fuzzy Sets Viewer Excel file to generate a diagram. |
| Defuzzification Method | centroid defuzzification method | Specify the method used. |