Appendices

Appendix A

Linguistic terms for Work in Queue, interpretations and the corresponding trimf parameters.

Description of Work in Queue	**General interpretation**	**Selection [Fuzzy Parameter]**
Short Work (SW)	The overall work time of the production of hex bolt is short.	3 to 4.4 hrs [2.9 3.75 4.6]
Medium Work (MW)	The overall work time of the production of hex bolt is moderate.	4.5 to 5.8 hrs [4.5 5.2 6]
Long Work (LW)	The overall work time of the production of hex bolt is long.	5.9 to 7.1 hrs [5.9 6.5 7.2]

Linguistic terms for Processing Time, interpretations and the corresponding trimf parameters.

Description of Processing Time	**General interpretation**	**Selection [Fuzzy Parameter]**
Short Processing Time (SPT)	The production of hex bolts per minute is fast.	62 to 80 bolts per min [61 71 81]
Medium Processing Time (MPT)	The production of hex bolts per minute is moderate.	45 to 62 bolts per min [45 53.5 62]
Long Processing Time (LPT)	The production of hex bolts per minute is slow.	25 to 44 bolts per min [24 35 46]

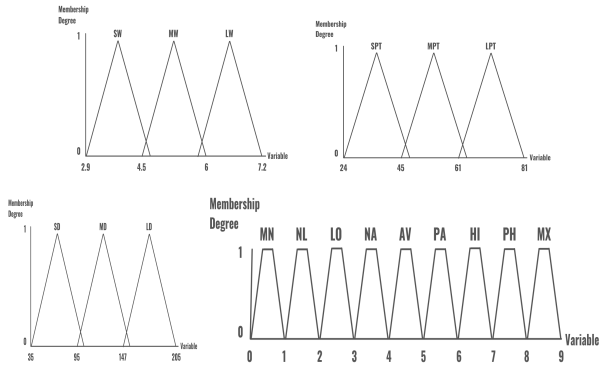
Linguistic terms for Distance, interpretations and the corresponding trimf parameters.

Description of Distance	**General interpretation**	**Selection [Fuzzy Parameter]**
Short Distance (SD)	The distance traveled from machine to machine is short.	40 to 94m [35 67.5 96]
Medium Distance (MD)	The distance traveled from machine to machine is moderate.	95 to 147m [95 121.5 148]
Long Distance (LD)	The distance traveled from machine to machine is long.	148 to 200 [147 174 205]

Linguistic terms for Route Selection, interpretations and the corresponding trapmf parameters.

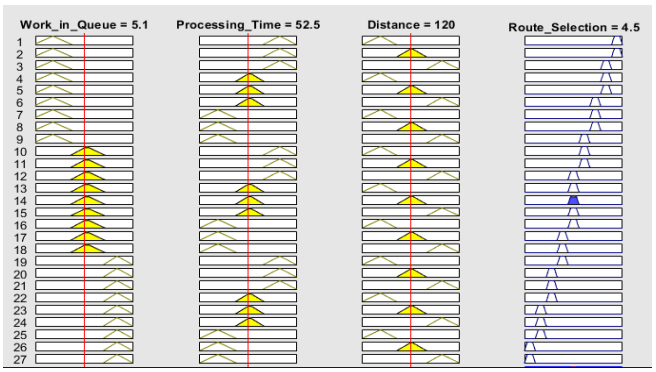
Description of Route Selection	**General interpretation**	**Parameters [Fuzzy Parameter]**
Minimum (MN)	The efficiency of Route Selection is minimum.	0 to 1 [0 0.25 0.75 1]
Negative Low (NL)	Selection is negatively low.	[1 1.25 1.75 2]
Low (LO)	The efficiency of Route Selection is low.	2 to 3 [2 2.25 2.75 3]
Negative Average (NA)	The efficiency of Route Selection is negatively average.	3 to 4 [3 3.25 3.75 4]
Average (AV)	The efficiency of Route Selection is average.	4 to 5 [4 4.25 4.75 5]
Positive Average (PA)	The efficiency of Route Selection is positively average.	5 to 6 [5 5.25 5.75 6]
High (HI)	The efficiency of Route Selection is high.	6 to 7 [6 6.25 6.75 7]
Positive High (PH)	The efficiency of Route Selection is positively high.	7 to 8 [7 7.25 7.75 8]
Maximum (MX)	The efficiency of Route Selection is maximum.	8 to 9 [8 8.25 8.75 9]

Appendix B



MF Plots of Input Variables. Work in Queue (top left), Processing Time (top right), Distance (bottom left), and Route Selection (bottom right).

Appendix C



Rule View of the Fuzzy Logic Design.