

Chapter 5

Conclusions and Future Work

5.1 Conclusions

The proposed method provides not only the first order differentiation (linear) information but also the second order differentiation information. In Table 4.4, we know that these 11 rules have an 100.00% in satisfying the first order differentiation characteristics and a mean of 72.24% in satisfying the second order differentiation characteristics. Other methodologies are less practical because most of them supply the constant rules (Gaweda et al., 2000), linear rules (Setiono et al., 2002) or non-linear rules (Satio and Nakano, 2002) that are hard to analyze.

In addition, our extracted rules have a very high ratio, 100.00%, in satisfying the first order (linear) characteristic. So, our method should be as good as REFANN (Setiono et al., 2002) for linear characteristics. REFANN only generates (linear) rules in the region existing training instances, but our method can supply the extra information in the region not existing training instances. For example, in Table 5.1, we find that Rule 3, Rule 4, Rule 5, Rule 9, Rule 10, and Rule 11 provide the extra information in these regions not existing training instances.

Table 5.1: The amount of training samples contained in the corresponding region of each rule.

	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
Amount of contained training samples	1	79	0	0	0	80	240	80	0	0	0

Summarily, our method owns the same effect as REFANN in the region existing training instances for linear rules and it can supply extra information in the region not existing training instances. In addition, our method supplies the non-linear informa-

tion, the second order differentiation. These are main advantages of our method.

5.2 Future Work

One of the future work is to examine whether our method still functions well in other empirical studies. Our method uses the multivariate polynomial whose highest order is two, so it cannot supply more than the second order non-linear information. Another future work is to find a better approximation of the activation function which can provide more non-linear information.

How to delete redundant constraints from the condition of a rule and how to reduce the number of the extracted rule may also both be the topics future studies.