

## Report on Domestic Company Internship for MERIT Course Work

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### [Period]

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### [Division and Company]

Material Creation & Analysis Dept, Material Engineering Div. No.2 , Advanced  
R&D and Engineering Company, TOYOTA MOTOR CORPORATION

### [Purpose]

My purposes of this internship are the follows.

1. To know the atmosphere of TOYOTA.
2. To know the application of machine learning methods to problems in companies.
3. To know whether my skill is enough to solve the practical problems or not.

The first purpose and the second purpose are for obtaining my job in TOYOTA. It is important to know whether the atmosphere of the company is comfortable for me or not. In addition, I want to obtain the job related to machine learning. Thus, the second purpose is important to get job of machine learning. The third purpose is to know how the practice in academic research is useful for industrial problems.

### [Detail of internship]

Comparing several machine learning methods, we determined the most efficient method to apply the target problem. The procedure was the following cycle. First, we applied one of the machine learning methods. Next, we established the hypothesis which feature of the method made the result. Third, according to the hypothesis, we compared the methods and set new conditions for comparing the performance more clearly. After that, we went back to the second procedure and performed the cycle. Finally, we proposed the method which had enough performance to solve the target problem. Especially, when we determined the most efficient method, we interviewed the team dealing with the target problem.

[Results]

I want to introduce the results from two perspectives. First perspective is about practical result within internship. The other is about the results of the above four purposes.

From the first perspective, as the result, I submitted a technical report to TOYOTA and created an achievement.

About the second perspective, let me raise the each result. First, I was able to learn about the corporate culture of TOYOTA. In particular, it is very good point for me to know the company is now struggling to review the elaborate customs and their traditional rules and learn new technologies and ideas. The activity is difficult for major Japanese big companies, but TOYOTA tries to do. Having this sense of crisis is very important, and I think that so-called large companies can hardly have. I think that it was a good result to know that Toyota is such a company. Regarding the second goal, I was able to learn the flow of the use of machine learning technology in a very specific way. In particular, it was found that it is important not only to implement the method, but also to understand what the team dealing with the target problem wants to do in practice and what kind of output they want to get. I realize it necessary that the ability to communicate, the ability to easily explain what you can do, and the ability to understand what results are required in practice are more important than the specific theory of the method. I think that it was a result that I was able to know the abilities that will be necessary for works using machine learning through the actual problems.

[For juniors]

I think there are the following four benefits in participating internship.

First benefit is knowing what kind of career they are in future, why the employees chose this company, how they are working now, what kind of values the company or the department is acting on and what they value especially. I felt that it is worthwhile that I could understand their values by actually going to work.

For the second point, it is important to obtain particularly confidence for our skills. In university, we are specifically required to have a specific range of research performance. The ability, however, required in companies is not only one. I think it is good point to realize that there are many values.

For the third point, through the internship, we can review our research in the university and create new ideas.

For the final point, we can review our sense of values. Usually, we focus on our research and we sometimes have prejudice about the value of life. However, in the

society, there are many kind of values. I think it is unfortunate not to understand the diversity and estimate our skills and values too low or too high. It is good point to realize it though participating internship.

[Acknowledgement]

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