

ROZARIO Mary - M2 MCI EUR

## Prediction using Deep Neural Network with Entity Embedding

Source : Google scholar : <https://www.sciencedirect.com/science/article/pii/S1877050919319301>

### KEY WORDS :

DNN, Entity Embedding, predictive process monitoring, deep neural network, entity embedding

In contrast to process mining studies, which tend to focus on the analysis of passing data, predictive process monitoring concentrates on the prediction of a running instance.

Thus, this paper presents an in-depth study of predictive business process monitoring. The latter focuses on predicting the remaining time for processes in progress.

In this paper, he takes the example of a customer who calls his insurance company for information on when he will be able to claim his insurance.

Here, in this situation, we see that the study highlights the ability to provide an estimate of the remaining time needed to complete the claims process, thus underlining the practical application of remaining time prediction in the insurance field.

This study highlights the potential of combining **deep neural networks (DNN)** with entity integration techniques to improve prediction accuracy in business process monitoring, in particular for predicting the remaining time of cases in progress.

The study focuses on improving the accuracy of remaining time prediction, particularly for data with categories.

Suggested method: Comparison of different methods in scenarios involving many categorical variables, highlighting the approach using a deep neural network (DNN) with the entity embedding technique, also known as Entity Embedding.

Experiments and results: **DNN + Entity Embedding = more accurate** than DNN + One Hot Encoding, in experiments conducted on real-world and synthetic datasets. Thus, the proposed DNN + Entity Embedding method proved particularly effective for high-dimensional datasets.

Study conclusion: The method demonstrated its effectiveness in predicting remaining time, which could only be beneficial for future work including hyper-parameter optimization and

the exploration of multitasking predictions, notably the prediction of the next activities of a process in progress.

The paper thus shows the importance of predictive process monitoring in various cases such as logistics management, focusing on the potential for improving decision-making and efficiency.