

Reviewing Articles on Modelling for Computer Science Students

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Abstract

The problems in the real world are too risky if we were going to solve it directly in the real world using, for example, trial and error. That action may lead to a high loss of budget, effort, and more importantly, safety risk maybe occur. So that we use modelling techniques to minimize those losses and make it much more effective and efficient. The first step of modelling is to convert the real-world problem into a modeled problem through observations. The problem that displayed by human sense and then refined the model using tools like a camera, microscope, etc. That process produces a model with a detailed picture of the problem. The reasoning process is a process that constructs new features from the known features without using senses instead we use our brain. After that we solve the problem in the model, so afterward we get a solved problem in the model. The solution obtained from the problem-solving in the model process is implemented in the action process. This action process, in this case, is to put it into a program through linear programming to convert the solution that has acquired from the model to a solution that can be applied in the world. In this paper, we review some papers and present some of the examples or the methods that could be used as a technique to represent a world problem into a model. We do so to spare time for Computer Science students so they do not have to read those articles, only this review. The review techniques are State-Space Representation, Trial and Error, and Divide and Conquer. State-Space Representation is a technique to represent a problem from a real-world using the tuple (A, s, G, O) , where A

is sets of possible states, s is starting state, and G is the set of goal states, at last O is the sets of operators, an operator is a function that takes one state as input and then gives one output state. The operator has a pre-condition and a post-condition. Trial and error in the model are lots convenient rather than trial and error directly in the real world because it will not affect anything in the real world. The characteristics of this model are doing many, repeated and various attempts until the problem in the model is successfully solved. Divide and conquer is also one of the many techniques of modelling. It breaks the big problem into sub-problems, by solving the sub-problems we solve the big one.

Keywords: Mathematical Modelling, State-Space Representation, Trial and Error, Divide and Conquer.