Top Graphical Models Applications in Real World

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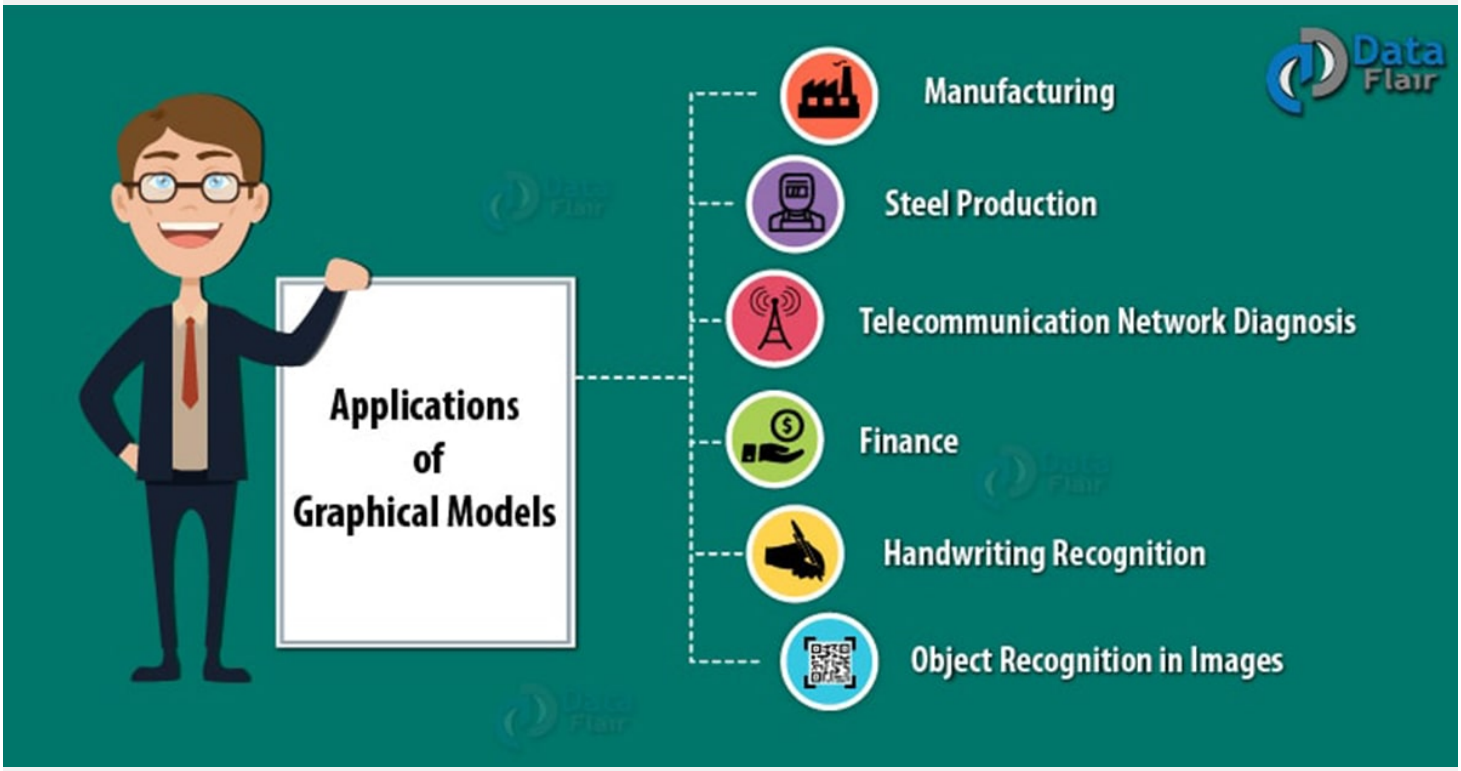
1. Graphical Models Applications

In our previous blog, we have discussed **what is Graphical Models?** Now we are going to explain the various Graphical Models Applications in real life such as – Manufacturing, finance, Steel Production, Handwriting Recognition etc. At last, we will discuss the case study about the use of Graphical Models in the Volkswagen. Lets begin with Applications of Graphical Models.



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2. Graphical Models Applications in Real Life

Let us now see few Graphical Models Applications:

2.1. Manufacturing

Graphical Models has its applications in Manufacturing field. Making the production of low cost and most reliable components at a high rate is possible. If all components of a

production system (i.e. machine tool operation, dispatching etc) work on optimized parameters. Compute this by using graphical models.

2.2. Finance

Graphs, because they are pictures. They are particularly appropriate for presentation of financial information. Presenting financial information requires a careful understanding of both “what you want to say” and “who you need to say it to“.

2.3. Steel Production

To calculate the emission of carbon dioxide for Steel’s deoxidation we use Graph model.

2.4. Handwriting Recognition

We can use Graphical models to recognize hand writing. It can also use in several applications. It uses hand writing for identification.

2.5. Telecommunication Network Diagnosis

We use Graphical models for diagnosing issues in it. It is used for help and to resolve them.

2.6. Object Recognition in Images

Graphical models provide a powerful framework for encoding. It provides the statistical structure of visual scenes. It also provides developing corresponding learning and inference algorithms.
To understand more the Graphical Models Applications let us take a Case Study of Volkswagen.

3. Case Study – Graphical Models Application at Volkswagen

Let us see the application of graphical model at Volkswagen:

a. Background

- The Volkswagen Corporation- It offers each customer the option of configuring their cars as individually as possible. A customer may choose from a wide variety of options which leads to high demand on logistics.

b. Problem

To attempt to achieve the ideal situation in which the customers provided by customized products built. By using components that arrive “just-in-time” for assembly, so that no stock is necessary at all.

For this to be possible, it is necessary to plan the production process with high precision. This requires most accurate prediction of supply of the components.

c. Solution

- Volkswagen adopted the idea that given certain properties others may select independently of each other. Thus making decomposition of the joint probability distribution possible.
- Based on this decomposition, Volkswagen estimated the frequency of relevant combinations of properties. The system assumed that all cars in the sales database had these combinations.
- The decomposition allowed Volkswagen to remove the restriction to individual configurations. So, enlarge the samples that could check because of the decomposition.
- Finally, Volkswagen computed the supply of individual components from these estimates.
- To build the graphical model, Volkswagen created a relational network based on a catalog of technical and marketing rules. Volkswagen created it to describe constructible cars.

To create the relational model it needs 3 steps:

i) Translate the catalog of technical and marketing rules into a relational representation. Represent All rules that refer to the same set of attributes by a relation over this set. Starting from the Cartesian product of the attribute domains, discard all tuples that are incompatible with one of the rules.

ii) Organize these relations in a lattice structure defined by the subset relation on the domains of the relations. Use the maximal elements of the resulting lattice as the maximal cliques of the graph of a relational graphical model. Turn the relational model into an undirected graphical model by taking the graph structure of the relational model. Estimate and enhance it with probabilistic distribution functions, from a sales database.

iii) Turn the relational model into an undirected graphical model by taking the graph structure of the relational model. Estimate and enhance it with probabilistic distribution functions, from a sales database.

This was all on Graphical Models Applications. If you found any other Graphical Models Applications, so do let us know by leaving a comment in a section given below.

See Also-

- Graphical Data Analysis Using R
- Applications of Machine Learning