Title: Predicting Supply Disruption
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Abstract:
Predicting supply disruption for a particular buyer provides that buyer with the ability to be efficient and proactive in their use of limited resources. Predicting supply disruption provides the buyer with the ability to mitigate risk, perhaps avoid a liability and possibly increase revenue. The Pharmaceutical industry and the Food industry are just two examples of industries that contain entities which require such buyers. These buyers replenish products on a continual basis. If there is enough lead time and the confidence level of the predictions is satisfactory then this forecasted behavior can be accommodated.

In the model that follows the position of the buyer in the supply chain is within a wholesaler who is first supplied by multiple distributors and who then supplies multiple retailers. For the purposes of this discussion, the emphasis of the supply disruption is on the wholesaler�s supply from its multiple distributors.

A measure valued diffusion algorithm is presented that can be used by the wholesaler to predict supply disruptions from its multiple distributors. Training and testing of this algorithm are by way of two contiguous blocks of time. Distributors are segmented based on the cardinality of the diversity of their inventory.

In a client use case that is presented, it is seen that the algorithm is robust in the sense of making some type of forecast for every product. It is also seen that the algorithm�s short term memory is about as effective as its longer term memory. A brief discussion follows that shows the success of this model. Comparison is made to a logistic regression model designed for the same use case and comparison is made to chance. Direction is offered on the use of this algorithm in conjunction with feature rich algorithms.