Joint Inference as a means of Enhancing Failure Prediction for Electricity Distribution

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The Center for Computational Learning Systems (CCLS) in cooperation with Consolidated Edison Company of New York (Con Edison) has developed failure analysis methods for electricity feeders within the power grid. Their methods of failure prediction use a complex array of variables and attributes, among which are joints and cables. A joint is used to connect distribution cables going in and out of a manhole: These joints often connect different types of cable and combine multiple cables running through the manhole. Joints can be divided into two types, stop and non-stop joints, both of which have unique failure rates. Of the two kinds of joints, stop joints tend to fail more frequently, and therefore have an established set of rules that govern their behavior for failure prediction. The need for a similar set of rules for non-stop joints became apparent. Through inference and research new logic was established for non-stop joints. This inference table was created to expand and enhance failure analysis done on feeders within underground networks in New York City. In addition to solidifying rules for non-stop joints, case studies on several manufacturers and configurations were done to analyze other possible uses of the inference data.