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Can You Dig It? Using Machine Learning to Efficiently Audit Utility Locator Tickets Prior to Excavation to Protect Underground Utilities

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Ordinary citizens rarely think about protecting underground utilities, until a water main has burst or internet service is interrupted by an excavation project. The project might be as small as a fence installation or as large as burying fiber optic cable along large sections of major highways. Many states and countries have a central service provider that distributes notices to utility companies regarding impending excavations. When contacted by the central service with a request, each utility company that services a parcel of land will mark the location of utility lines alerting excavators and thereby preventing service interruptions and protecting workers and citizens alike from serious injury, or even death. That provider is VA811.com in Virginia, United States.

At VA811.com, an increasing number of excavation tickets are entered via web users, which have a higher number of errors, as opposed to those entered by call agents. Until recently, VA811 has performed random audits of their tickets. In 2020, VA811.com approached the Virginia Tech Statistical Applications and Innovations Group (VT SAIG) to build a predictive model that would screen for problematic tickets. Since then, VT SAIG has developed two predictive models. This talk will detail the case study in the context of the phases of Cross Industry Standard Data Mining Practice (CRISP-DM). Statistical methods include measurement systems analysis and gradient boosted machines. Features were engineered using text mining and geographical information systems data. Practical aspects of project implementation will also be discussed including data cleaning, model implementation, and model monitoring.

Keywords

Machine Learning, Quality Audit; Case Study

Classification

Mainly application

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