A Data-Driven Early Warning System for Mining Accidents

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Abstract—

Often, safety condition of a mine deteriorates before an accident happens. For example, before the 2010 Upper Big Branch Mine disaster, one of the largest in the U.S. history, the mine displayed an alarming rising trend of safety violations. Similar building-up behaviors apply to other major mining accidents in the U.S. According to the Mine Safety and Health Administration (MSHA), on average, there are more than a hundred thousand citations and orders issued yearly. The MSHA accident and inspection databases are an untapped resource for safety analysis. Our model analyzes semi-structured data from MSHA, attempting to uncover a company's safety culture from its public regulatory records. This work has implications for developing a data-driven early warning system. In the future, we plan to extend this research to inspection data from the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA).

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REFERENCES

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