ADVANCED LEARNING FOR ENERGY RISK TRACKING (ALERT)

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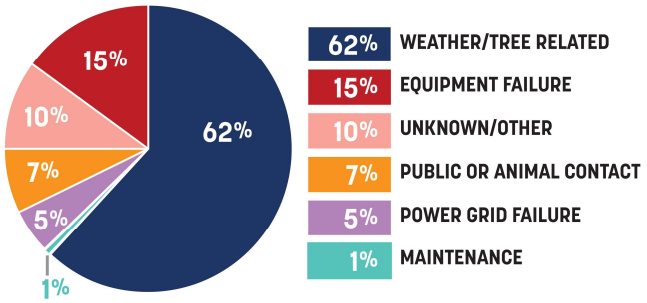
Power outages in distribution grids pose a significant threat to safety, well-being and economy. Power interruptions inflict both monetary and societal damages to the communities.

Developing the state of risk (SoR) model for outage prediction fuses diverse data reflecting causes of outages into a data model. The research will advance multimodal data models and their use in optimizing spatiotemporal SoR in critical infrastructures. Project also address socio-behavioral aspects of community engagement subject to power outages.

PROBLEM

MAJOR CAUSES OF POWER OUTAGES IN THE U.S.



The NDAs between all parties were signed allowing for sensitive data transfer from utility and customers to developers.
The secure storage for data was obtained by collaborating with IT that enabled Cloud computing services to process the data.

Initial data explorations are completed. Behavioral experiments conducted for customer choice of mitigation actions are underway. Development of power outage SoR prediction model has been initiated and variety of candidate ML algorithms are tested .

Immediate impacts of the proposed approach include reduction of detrimental impacts from unplanned outages to customers and utilities. The mitigation measures are feasible due to the prediction offering time to plan.

Broader impact is in improvement of reliability and resilience of distribution grids, allowing secure grid operation. In the long run the entire society benefits from reduced duration and number of outages.

Future Plans:

Develop a first prototype of SoR prediction. Define existing and potential mitigation measures by different stakeholders. Conduct a survey of residential customers to asses acceptance.