DEEPFIRE ADVANCES IN $11 MILLION XPRIZE WILDFIRE COMPETITION

"Managing fire is the most primeval of human endeavors, yet we still remain far from full mastery," says Richard J. Barbalace, CEO of Ailectric. The company forms the core of the DeepFire team, which advanced on April 17 to the next round of the Space-Based Wildfire Detection and Intelligence Track of XPRIZE Wildfire, a four-year, $11 million competition to develop innovative firefighting technologies. Led by Louisiana State University professor and Ailectric chief scientist Supratik Mukhopadhyay, Deepfire is one of only twenty teams to advance in the competition track, down from over 120 teams at its start last year.
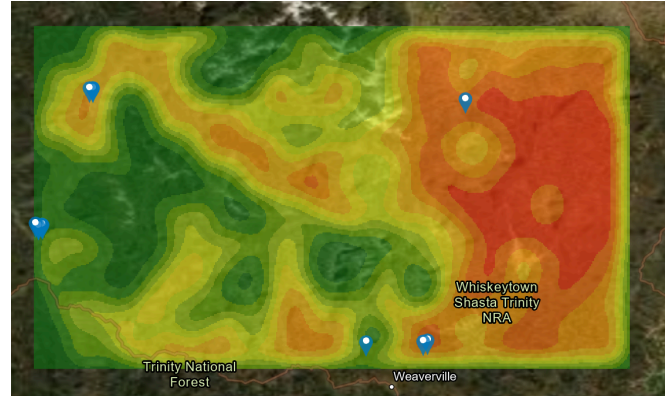
Over 70,000 wildfires burn an average of 5 million acres, cause billions of dollars of damage, and take dozens of lives every year in the United States alone. Globally, wildfires generated approximately 2,170 megatonnes of carbon emissions in 2023 according to the Copernicus Atmosphere Monitoring Service. "The cost of wildfires has grown astronomically," Barbalace adds. "We need innovative solutions to save lives, property, and ecosystems. Expanding detection of wildfires from space will form a key element in ensuring safety in the future."

As the XPRIZE Wildfire competition guidelines explain, "For over a century, the primary fire management approach in many places was to suppress any fire, in turn allowing more vegetation to accumulate on the ground, feeding extreme fires. This practice has begun to shift in recent years, but in light of global trends including a changing climate and the expanding Wildland-Urban Interface (WUI), the risk of extreme wildfires will continue to heighten, increasingly outpacing present-day wildfire management capacity."

DeepFire's technology combines multiple synergistic artificial intelligence (AI) systems for wildfire prediction, real-time detection, and future spread. Predictions can aid in repositioning automated cameras to seek out suspected wildfire ignitions, cutting down the detection and response times. Detections can feed into fire forecasting models to predict future behavior, such as direction and speed of the spread. Spread models alert communities of imminent danger and inform how best to mitigate the crisis. These advances have been driven by years of research in AI, computer vision, and system dynamics. Dr. Mukhopadhyay previously led a team to the semifinal of the IBM Watson AI XPRIZE. Other team members include Ailectric's vice president of engineering Dr. Robert DiBiano, LSU graduate Dylan Wichman, and MIT graduate and emergency services expert Matt Braun.

"Our system combines a prediction system, a detection system, and a spread modeling system that cooperate with each other," Mukhopadhyay said. "This enables us to pinpoint our detection system to areas that are predicted to have a high risk of wildfire and deploy resources accordingly. In addition, we know which direction the wildfire will spread, which enables our detection system to focus on more fire-prone areas increasing its detection accuracy compared to current wildfire detection methods that focus primarily on detection." The prediction system has shown around 90% accuracy in predicting wildfires weeks before they have started in a variety of locations that include the United States, Canada, and Indonesia. By advancing in the competition, the DeepFire team has won $37,500 in this round, which will be used for further development of the technology.

"Our goal is to bring all dangerous wildfires under control," stated Barbalace. "There are many critical steps in this process to predict, prevent, detect, prioritize, and suppress fires. While XPRIZE is a competition, it will take cooperation from many stakeholders to ensure a scalable and global solution. We look forward to guiding the front line of innovation."