



METEC STUDENT:

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PROJECT:

Automated Identification of Oil Field Features using CNNs

Oil and gas production sites have been identified as a major source of anthropogenic methane emissions. Emissions studies utilize counts of equipment to estimate emissions from production facilities. So, the accuracy of the counts has a substantial impact on the modelled emissions. The location of wells is generally well known, as the location of the bore hole, drilling direction, and production is reported to state authorities. While traditional field development integrated wells directly onto well pads containing initial processing equipment, such as separators and tanks, in recent development, wellheads are often at a substantial distance from the well pad containing that equipment. Further, reporting of well pad locations is typically not required, and few location-specific data sets exist. However, these counts are poorly documented, including both information about well pad locations and major equipment on each well pad. While these data can be found by manually reviewing satellite imagery, it is prohibitively difficult and time consuming. So, we adapted a machine learning (ML) algorithm to detect well pads and associated equipment from recent satellite imagery. Our initial model showed an average well pad detection accuracy of 95% on the Denver-Julesburg (DJ) basin in northeastern Colorado. Our work demonstrates the potential for this type of automated detection from satellite imagery, leading to more accurate and complete models of production emissions.