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Visualization of the growth and production of grapes through analysis of sensory data

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ABSTRACT

Grapes used in the wine industry have been one of the highest value crops in the United States. However, with unpredictable weather changes and recent drought in the Western United States, vineyard owners and grape growers have faced difficulties on producing good quality grapes suited for wine making. Therefore, a technology that would keep record of environmental data and incorporate the data to support agricultural decisions will help the growers to produce quality grapes even in extreme conditions. As such, this research focuses on developing an interactive system that uses sensory data and visual analytics to facilitate vineyard management and agricultural decisions (such as choosing irrigation strategy and deciding harvesting date) through predictive analysis and historical comparisons. The system visualizes the data gathered by data loggers at vineyard sites to aid growers in decision making. The current system incorporates a stack zooming graph of historical temperature data from different sites and depths with annotation of important dates like bud break and harvest. This stack zooming graph can also be used to check for any erroneous data and implement database cleaning to fix these errors. Some analysis of agricultural characteristics such as soil type and moisture relationship and collective effects of different weather components are currently being done. As this is an ongoing project, integrating new features with better predictive analysis and more visuals will be necessary for the growers to rely on this system.

KEYWORDS

Visual Analytics, Viticulture, Data Cleaning, Sensory Data