

# Machine learning and spatial analysis for big data analytics in food and ag industries

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Remote sensing data are globally available and relatively inexpensive. It is frequently used in many computational applications, such as climate modeling. Multi-spectral satellite images, which include information in addition to the visible wavelengths (RGB), have fairly high spatial and temporal resolution, and contain a wealth of information on vegetation growth and thus on agricultural outcomes.

There is a growing interest on applying state-of-the-art machine learning techniques, such as Gaussian process and deep learning, for accurately predicting crop yields well before harvest. This would help to address the challenge of food security issues and support the development and optimization crop insurance program, which has new liabilities in excess of \$114 billion per year.

This project aims to applying machine learning algorithms to remote sensing data for estimation of crop yields across geographic regions. The student(s) will also delivering spatial analysis for crop yield estimation at scales. The student(s) will get familiar with Python, R, and/or MATLAB, and also gain knowledge about GIS systems for spatial analysis.

