Satellite remote sensing of soybean seed composition with AI

Kamila Dilmurat, Vasit Sagan, Kristin Rhodes, and Felix Fritschi

Abstract:

Preharvest seed composition estimation using satellite imaging provides critical information for food security planning and management at a regional scale. As one of the staple crops, soybean plays an essential role in U.S. economic development. Estimating soybean seed composition is the precondition for improving seed quality and meal content at scale, maintaining U.S. soy competence in international markets. Traditionally, soybean seed compositions are measured after harvest via wet chemistry analysis, which is time-consuming and expensive. This study presents very first, to the best of our knowledge, satellite remote sensing of soybean seed composition. We demonstrate that WorldView-3 satellite imagery and machine/deep learning is a power tool to predict seed composition from standing crops