## Implementation of a Novel Protein Crystal Image Analysis Package

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Crystal Resolve is automated image analysis software for protein crystallography. It is offered as an add on package for the Crystal Farm product line.

Crystal Resolve uses proprietary high precision subpixel image processing and object recognition algorithms to decompose an image into thousands of significant micro features. It applies specific knowledge of the drop type and plate geometry along with neural networks and advanced heuristic methods to classify these features while developing a macroscopic comprehension of image contents. From this, it computes two key metrics.  $F_C$  describes how crystal-like (0.0-1.0) the image is.  $F_P$  describes how precipitate-like the image is.

For all its complexity, Crystal Resolve is very easy to use. Users are given the flexibility to choose which images should be reviewed in terms of their  $F_C$  and  $F_P$  values. Crystal Resolve easily identifies images with no interesting content, greatly saving researchers' time.

Crystal Resolve benefits projects with hard to find crystals by allowing users to select and view images with poorer  $F_C$  figures. Crystal Resolve frequently finds objects that some crystallographers miss while not getting confused by dust, bubbles, and plate features.

Some examples of analyzed images from different crystallization plates will be presented.

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