Systems and Methods for Automatically Determining Object Information

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing an algorithm designed to automatically extract information about crystal size from *in situ* digital images of suspended, high-aspect-ratio crystals.

Overview

The specialty chemical and pharmaceutical industries frequently use suspension crystallization processes to create crystalline solids with consistent and desirable properties. Controlling the particle size distribution (PSD) of crystal-forming chemical compounds, including those that form rod-like crystals with high aspect ratio, is an important step in optimizing the efficiency of the manufacturing process; however, conventional techniques for determining the PSD of a group of crystals lack effectiveness for high-aspect-ratio crystals and/or require the removal of a sample from the crystallization reaction vessel.

The Invention

UW-Madison researchers have developed an algorithm designed to automatically extract information about crystal size from *in situ* digital images of suspended, high-aspect-ratio crystals. The algorithm combines linear features within the digital images into related groups and analyzes them to determine information about the size, shape and orientation of the crystals. This information can be used to control processes or devices associated with the crystals, thereby maximizing manufacturing efficiency.

Applications

- Monitoring crystal size distribution
- Locating and segmenting other high-aspect ratio objects from an image to analyze one or more of the objects

Key Benefits

- Rapid speed allows real-time monitoring of crystal size distribution during the manufacturing process.
- Results agree with those obtained by manual sizing of crystals.
- Does not require removal of a sample
- Algorithm can locate objects from low quality images with less than ideal contrast, brightness, focus or other lighting parameters; with objects incompletely in the field of view and/or overlapping; with objects at arbitrary locations; or with varying lighting conditions.
- Can be applied to crystal populations having a wide range of aspect ratios

Tech Fields
- [Information Technology : Image processing](#)

For current licensing status, please contact Emily Bauer at emily@warf.org or 608-960-9842.

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