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Software for Differential Dynamic Microscopy (DDMCalc)

Tech ID: 25669 / UC Case 2016-317-0

BRIEF DESCRIPTION

A MATLAB code for performing differential dynamic microscopy (DDM).

BACKGROUND

Video imaging is becoming increasingly common for inline testing, monitoring or optimization of processes and products that involve dynamical processes (motion or development of objects and structures). There are challenges involved with analysis of such videos to extract precise information that would influence decision making and design, either because the dynamics are subtle and unapparent to the naked eye, or because they are readily apparent but hard to quantify. One potential solution involves statistical constructs that give information about the temporal and spatial correlations of motion within a video. A powerful example is differential dynamic microscopy (DDM) analysis. However, there is a lack of code available to perform DDM effectively and statistically analyze data from existing algorithms.

DESCRIPTION

Researchers at UC Santa Barbara have created a MATLAB code for performing differential dynamic microscopy (DDM). The invention takes a time sequence of video images as input, and produces statistical information regarding time and spatial correlations of the motion occurring within the video images. The software also includes a module for regression of data to extract the diffusivity for systems undergoing diffusive motion. No other code has been made available to perform the mentioned algorithm and/or statistically analyze the data from it.

ADVANTAGES

▶ Simple, objective quantification of motion and dynamics occurring in potentially low-quality or high-noise video images

▶ The only commercially available code to perform a DDM algorithm and/or statistically analyze data

APPLICATIONS

▶ Measuring diffusivities/sizes of particles and other structures in small quantities

▶ Velocimetry and differentiating velocity from diffusive motion

▶ Measuring collective dynamics of complex fluids and groups of objects

▶ Measuring kinetic processes/stability in formulated products

▶ Motions of biological systems/swarms

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OTHER INFORMATION

KEYWORDS

video, software, DDM, MATLAB code, imaging, indansens, indsoftw

CATEGORIZED AS

▶ **Communications**
  ▶ Other
▶ **Computer**
  ▶ Software
▶ **Imaging**
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