



University of Central Florida

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Improved Algorithm to Count Dense Crowds

Count the number of people in images of crowds of greater size and density.

While dense crowds occur frequently in ticketed events like concerts, marathons, religious ceremonies, and sports games, obtaining a count of participants is relatively easy. However, in events where participants are not registered, measuring the number of constantly shifting attendees often becomes crucial as in the cases of political speeches and public protests. Determination of the exact size of a crowd can be important to candidates, the media, or law enforcement, and relying on human estimation or inadequate algorithms can lead to errors. A need for a method to accurately count dense crowds in still images or video is needed.

Advantages

Instead of manually counting individuals in very dense crowds, this algorithm automatically provides an accurate head count from video or still images. Existing crowd-counting algorithms cannot distinguish individuals in crowds of hundreds or thousands, resulting in counting errors. Most of the existing algorithms for exact counting have been tested on low to medium density crowds (3-53 people per frame). In contrast, the new algorithm produces accurate counts from still images or video containing an average of 1,280 people per frame.

Technical Details

The new method from UCF to count dense crowds of people works by analyzing an image at multiple densities. Although the density of people varies across the image, adjacent patches should be similar allowing for an accurate estimate by counting individuals in small patches. In medium density crowds, the process recognizes the periodic occurrence of heads – the harmonics, which it captures through Fourier analysis, and, in high density crowds, the texture of the crowd is captured through scale-invariant feature transform. The algorithm functions with new constraints in multi-scale Markov random field to infer a single count over the entire image.

UCF Inventors

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Benefits

- Handles higher crowd densities
- Requires only still images

Applications

- Crowd management
- Event attendance
- News reporting

Tech Fields

Computer Vision, Software

Keywords

crowd counting, crowd management, Fourier analysis, multi-scale Markov random field

If you or your company are interested in this opportunity, Contact:

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