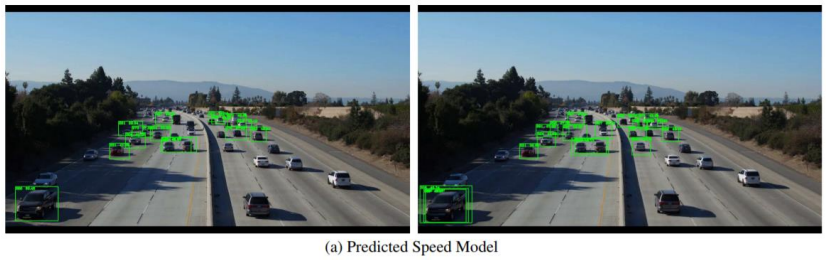
Licensing is now available for Optical Flow Background Estimation for Object Tracking

Abstract

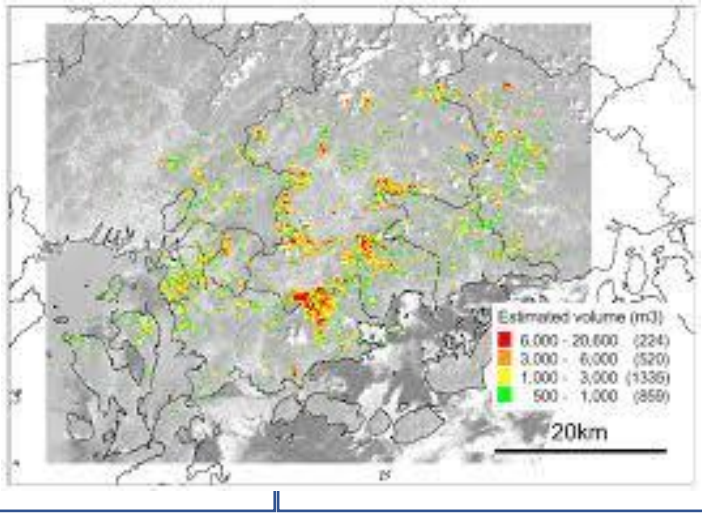
A revolutionary object tracking method for State, Local, Education, and Utility markets, able to enhance data capture capabilities over static camera systems. For these systems to be effective for metrology purposes, they will need to respond to the test article in real-time with a minimum of additional uncertainty. A methodology is presented here for obtaining high-resolution, high frame-rate images, of objects traveling at speeds P1.2 m/s at 1 m from the camera by tracking the moving texture of an object. Strong corners are determined and used as flow points using implementations on a central processing units (CPU). Based on directed pan/tilt motion, a pixel-to-pixel relationship is used to estimate whether optical flow points fit background motion, dynamic motion or noise. To smooth variation, a two-dimensional position and velocity vector is used with a Kalman filter to predict the next required position of the camera, so the object stays centered in the image. High resolution images can be stored by a parallel process resulting in a high frame rate procession of images for post-processing. The results provide real-time tracking on a portable system using a pan/tilt unit for generic moving targets where no training is required, and camera motion is observed from high accuracy encoders opposed to image correlation.

A modern CPU Algorithm For Object Detection and Tracking with Autonomous Pan/Tilt/zoom capabilities for Embedded Object Detection, Tracking, and Inference Markets, Applications, and Services to drive demand for latest generation Processors at the Edge. <u>Expensive GPU is NOT Required for this Solution</u>.



(a) Predicted Speed Model

(b) Constant Speed Model



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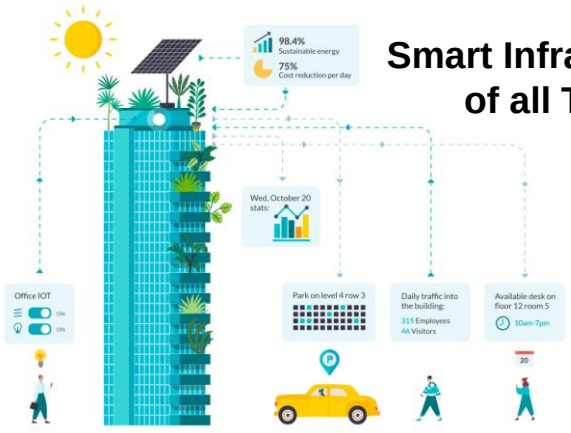
Visual Target Detection and Autonomous Tracking Capabilities for Smart Devices, VR, and IoT

Fig. 12. A sequence of frames, approximately 0.24 s apart for one period, of a swinging SUT with the center of the image identified by a white diamond, previous points shown as green rectangles, $\mathbf{g}_{i-1}$, current optical flow points as white, closed circles, $\mathbf{g}_i$, estimated points as green, open circles, $\hat{\mathbf{g}}_i$, and removed outliers shown as red, closed circles. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Sample Embedded Opportunities

Surveillance Systems



Smart Infrastructure of all Types

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