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Toshkent shahri

–O’zgarish – barqarorlikdagi individ navbati yangi individga ko‘ra sekin o‘zgarishi, bu tabiiy jarayon.

–Peshqadamlik – individ noodatiy yoki tezkor kirish navbati old tomonga o‘zgarishi, bunday sigirlar asosan podadan chiqish vaqti yaqinlashgan yoki tartibsiz bo‘lib, ular sog‘lom va sut mahsuldorligi kam bo‘ladi.

–Havfli – individ tezkor kirish navbatida orqa tomon o‘zgarishi, bu sigirda kasallik havfini ko‘rsatuvchi jarayon.

Tahlilda ko‘nikish davri qaralmaydi.

REMOVING RAIN TRACKS FROM IMAGES USING IMAGE PROCESSING ALGORITHMS

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Abstract: *This article discusses the problem of removing rain tracks from video. Although it is important to remove rain tracks from the image, there is not much research in this area and there are no reliable real-time algorithms. Difficulties in the rain trail removal algorithm are caused by the difficulty of seeing, low light, and the presence of a moving camera and objects. The problem facing the rain line restoration algorithm is to identify the rain lines and replace them with their original values for image processing. In this paper, we discuss the use of photometric and chromatic features for rain detection. An updated Gaussian mixture model (updated GMM) detected moving objects. This rain streak removal algorithm is used to detect rain streaks in videos and replace them with calculated values equal to the original value. Spatial and temporal features are used to replace rain lines with their original values.*

Keywords: Dynamic Image, Threshold Filters, Gaussian Mixture Model (GMM), Rain Line Removal, Image Processing, Video.

The external vision system used for surveillance and monitoring systems is a concern today. However, most of the algorithms used in outdoor tracking systems require accurate weather, and the performance of algorithms degrades under bad weather conditions such as rain, fog, snow, etc. Bad weather reduces image and video quality, which negatively affects the performance of computer vision algorithms. Many computer vision algorithms used in outdoor surveillance systems require good image quality for object detection, tracking, segmentation, and recognition. Therefore, it is very difficult to operate such an algorithm in different weather conditions.

According to the type, bad weather conditions are divided into two types: stable weather and dynamic weather [9]. Stable weather consists of fog, fog, and fog. These particles are smaller (1-10 μm). It is very difficult to identify each particle individually with a camera. Each pixel is affected by the cumulative effect of several particles. In dynamic weather conditions, rain and snow. These particles are 1000 times larger than stable weather particles. Due to their larger size, these particles are clearly visible to the camera. Each particle affects several pixels in the image.

Rain is the main component of dynamic weather. Rain bands are spatially and temporally distributed. Rain causes sudden changes in intensity. Visibility at the scene was reduced due to rain.

Raindrops refract and reflect light around them. This makes rain streaks clearly visible, which degrades image quality. Removing rain from an image is a painstaking task. Rain streaks interfere with the image analysis algorithm, which depends on the video captured by the camera. A security camera does not want its motion detection to trigger in different weather conditions. Streaks can also confuse face recognition algorithms when raindrops obscure parts of the face [4]-[6].

Visibility in the rainy season is lower than in the summer season. Rain causes drastic changes in the pixel intensity of images and videos. The specific physical properties of rain are its small size, high speed and spatial distribution [9]. Rain bands are wider than stable weather, making visibility more obscure. These lines are visible to video recording sensors.

The article is divided into different sections, as the next section presents a literature review of different articles in the same field. Various properties of rain used for rain removal and the Stauffer-Grimson method are explained in detail. The explanation, comparison of the proposed algorithm with the existing algorithm is concluded in the Algorithm, Results and Discussion section. The effectiveness of our algorithm is demonstrated in detail using several examples.

The article [1] describes an algorithm for checking facial expressions of a driver driving a vehicle. The properties are recorded and correspond to a default existing property stored in the database. The method used to check the driver's drowsiness has helped to reduce abnormal movements while driving. This drowsiness can be checked by checking eye blinks and head movements. This algorithm has problems in rainy situations.

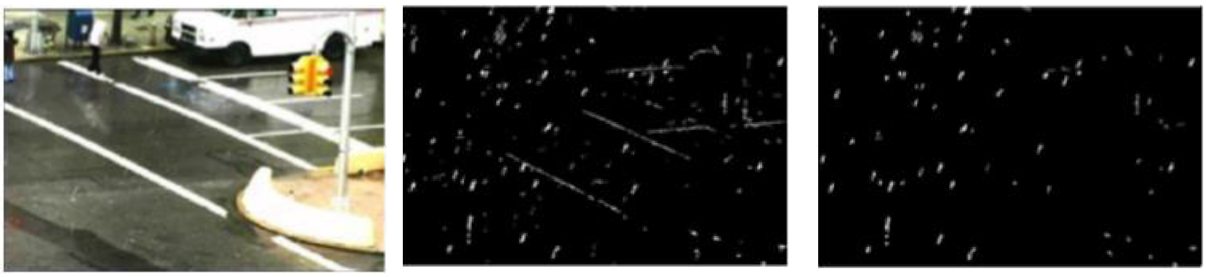
Kshitiz Garg and Shri K. Nayar presented the characteristics of rain. They experimentally proved that the appearance of rain depends on camera parameters, such as exposure time and depth of field [3]. Using these options, the appearance of rain is removed without changing the scene. They proposed an algorithm that removes the rain effect without further processing. However, this method cannot handle scenes with heavy rain or object movement. You have to adjust the camera settings manually each time.

Triparty [4] proposed a probabilistic spatiotemporal model in which they used various statistical properties such as the range of intensity variation and the symmetry of the distribution. This is necessary to classify rain pixels and remove false pixels detected during rain. This algorithm works only in the intensity plane. It uses spatio-temporal features to reconstruct the scene. This algorithm is capable of dynamic scene processing. The time complexity is also less. But some statistical functions detect many false rain pixels.

Ji Chen and Lap Pui Chau [5] proposed a video rain removal algorithm in which they separated moving objects and rain pixels. A Gaussian mixture model (GMM) along with optical flow and color cluster flow is used for motion detection. They used photometric and chromatic properties to identify rain pixels. They then used a rain removal filter to reconstruct the scene based on the motion pixels. To restore this scene. Both spatial and temporal data are used to reconstruct rain pixels. The proposed algorithm performs better in a dynamic scene with lots of movement. However, the time required by the algorithm is very long.

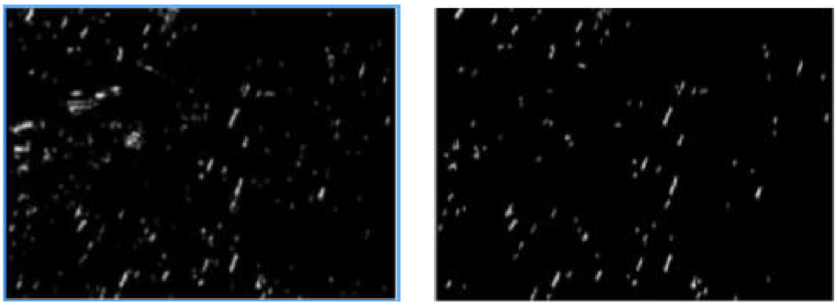
AK Tripathi, S. Mukhopadhyay [7] proposed an algorithm that uses spatio-temporal characteristics of rain along with meteorological characteristics to locate and remove rain from the scene. Various shape features such as area, aspect ratio, etc. are used to recognize rain pixels and moving objects. The proposed algorithm works only on the intensity plane, which reduces the time complexity of the algorithm and uses time frames to reconstruct the scene. The edges of the object are detected if the frames are not properly aligned.

Images taken outdoors are degraded by various weather conditions such as rain, fog, steam, etc. The visual appearance of rain causes a sharp change in image intensity. This makes it difficult to implement computer vision algorithms. During the rainy season, rain streaks degrade the performance of applications that rely on video input, such as object tracking, video surveillance, robot navigation, etc. Existing rain removal algorithms are used for offline post-processing, which takes time to process the data. As a result, it blurs the final image. Some algorithms reproduce the scene correctly, but the algorithm complexity and processing time are too long. One of the important problems of existing rain removal algorithm is to predict the original value of rain pixels. In the motion region, the pixel intensity is highly distorted due to the rapid change in motion pixel intensity. This method replaces the wrong intensity. In addition, the rain detection step leads to high false positive and false detection rates, which leads to poor frame reconstruction in the case of video.



(a) b) c)

Figure 1 . It 's raining determination . It 's raining access frame (a) (size - 480 X 720) (b) Photometric and chromatic from the features used without the rain determination results (c) Prewitt border detector from the application after the rain determination results .



a) b)

Figure 2 : Final rain mask (a) Photometric , chromatic , connected components and edge detector features from the application after the rain determination (b) of (a) step at the exit line width feature from the application after the rain determination

It 's raining lines image across spatial respectively is distributed . It 's raining to himself special physicist from the features one is speed [9]. It 's raining lines high at speed get down and go in personnel one different pixel rain with not covered provides [2]. It 's raining of intensity sharp o ' change take will come .

According to the photometric property, rain pixels appear brighter than the background. Considering the background and the rainy frame, the intensity value of the rainy pixel is greater than the intensity value of the next frame. In this case, the difference of consecutive frames is taken into account with the next limit. The threshold value is chosen so that the rain pixels are recognized correctly and with less noise. If the threshold value is high, we may miss some rain pixels, and if it is low, the noise will be detected as a rain pixel. Experimentally, the threshold value should be between 5 and 12. The photometric property equation is shown below.

$$I_{thr} = \begin{cases} 1 & I_N - \quad I_{N-1} \geq T \\ 0 & I_N - \quad I_{N-1} \leq T \end{cases}$$

Here, I is $_{\text{the Nth}}$ frame and T is the threshold used to separate the rain.

Rain pixels are extracted after applying photometric properties. But along with the rain pixels, the movement of the rain is detected. Recovering such mis-detected rainy pixels can spoil the scene. This effect is more pronounced at the edges. Therefore, rain detection needs some improvement. For the improvement process, we must first focus on the moving object and the edges. Thus, the chromatic property of rain is used together with the photometric property. Chromatic property indicates that the absolute sum of the color channel differences (C) caused by rain should be between C=7 and 20 [4] [9].

$$(\Delta R - \Delta G)^2 + (\Delta G - \Delta B)^2 + (\Delta B - \Delta R)^2 \leq C$$

If the value of C is low, some rain pixels will be missed, and if it is high, the noise will be detected as a rain pixel. Experimentally, the value of C should be between 15 and 20. Noise is reduced after applying a chromatic feature to rain detected by a photometric feature.

Because rain pixels are smaller in size, the area covered by rain lines is used to separate rain from moving objects. The associated rain zone is limited to a few pixels beyond the moving object. Noise is reduced after applying a bound component to detected rain lines. The value of the coupling component is chosen in such a way that all rain lines are detected [5]. Experimentally, the value of the connected component varies from 8 to 600.

After applying the photometric features, chromatic features, and coupling component, the rain pixels are cleaned. Some edges of the object are recognized as rain pixels. Prewitt edge operator [4] is used to remove bad rain pixels. Three consecutive frames are needed to classify the edges. We need to divide edges into static and dynamic. If the same edge is present in three consecutive frames, then this edge belongs to a static edge, otherwise it is part of a moving object. Removing extraneous pixels in this way gives good results.

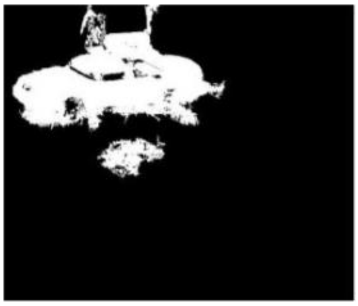
Incorrectly detected rain line edges are removed, so these pixels are ignored when painting, preserving edges, and preventing output blurring. After applying this step, the rain pixels will be separated from the frame. However, there are some pixels that satisfy all the above characteristics but are not part of the rain. These smaller rain bands are removed by examining the width of the rain bands. Rain lines and moving objects are separated.

The next step is to measure the width of the rain bands. First, we need to define each rainband so that we can classify each rainband. Then we move horizontally to find out only the number of rain pixels in the current row, that is, we scan the entire row and only find the maximum number of the same symbol in a particular row. This is the width of the rain band. A threshold value of 15 to 20 is used experimentally.

Motion pixel segmentation

Sudden changes in intensity occur due to rain and object movement. We need to separate motion pixels because the intensity of motion pixels changes rapidly [5]. If the rain line hits a moving object, it is difficult to replace the rain line with the current approach. This distorts the scene because the motion pixels change faster than the background pixels. A Gaussian mixture model (GMM) is used for motion detection.

a)



b)

Figure 3 : GMM using movement area segmentation simulation to do result (a) Introduction frame (480 X 720) (b) GMM using previous the background determination result

In GMM, each pixel can be represented as a mixture of Gaussian distribution [12]. Initially, each Gaussian is given equal weights. All weights must sum to 1. The weight parameter indicates the amount of time a certain intensity is present in the scene. The next step is to classify the Gaussian distribution of pixels into background and foreground. At any time t, all that is known about a given pixel { x 0 , y 0 } is its history.

$$\{X_1, \ldots\ldots, X_t\} = \{I(x_0 y_0 i: 1 \leq i \leq t)\}$$

where I is the image sequence and i is the frame number. If the background is static, the pixel value will be the same over time. Each pixel scene is modeled by Gaussian (K) distributed numbers [11]-[12]. The K value is measured using two parameters, available memory and processing power. The value of K indicates how many lights to model. Pixel part of several plays on stage for the first time. GMM is used to change the definition when a previous object appears in the scene. Multiple Gaussian distributions were used to determine power. . The structural background is modeled using a first Gaussian. If there is a sudden change in the image, the second Gaussian pass follows the changes and the first Gaussian pass preserves the background. The value of K determines the number of such backgrounds to be simulated.

But increasing the value of K increases the complexity of the scheme. Therefore, it is necessary to determine the value of K. Experimentally, its value is from 3 to 5. The probability distribution of the criteria defined by the equations is shown below:

$$P(X_t)=\sum_{i=1}^{k} w_{i,t} * n(X_t, \mu_{i,t}, \Sigma_{i,t})$$

$w_{i,t}$ – bu yerdaThe weight assigned to each Gaussian and the n - K-component normal Gaussian distribution are given by the equation shown below:

$$N(X_t, \mu, \Sigma)=\frac{1}{(2\pi)^{\frac{n}{2}} |\Sigma|^{\frac{1}{2}}} e^{-\frac{1}{2}} (x_t-\mu_t)^T \Sigma^{-1} (X_t-\mu_t)$$

$\mu$is the mean of each Gaussian and Σis the covariance of each Gaussian. To reduce the time required for the algorithm to work, the covariance matrix is obtained as shown below:

$$\Sigma_{k,t}=\sigma_k^2 I$$

Equation (6) assumes that the pixel values of red (R), green (G), and blue (B) are independent and have equal variances. But not in real time. They considered it necessary to reduce the number of calculations that reduce the accuracy of the algorithm. Each pixel is modeled using a Gaussian distribution. Accordingly, all Gaussian distributions were updated. First, the average covariance and weights need to be determined.

Our algorithm uses temporal pixels to reconstruct the scene. If the current pixel contains rain, its value is replaced by the intensity of the nearest temporary pixel that is not part of the rain [1]. If there is motion in the scene, the pixels will be replaced incorrectly [4]. Instead of replacing a pixel directly, the pixel intensity can be calculated by applying different pixels next to the pixel [4]. The motion pixel can be affected at this stage. The rain pixels inside the moving object and the background should be processed separately. Since the motion pixel changes rapidly, we need to use the neighboring motion pixels without rain to replace this damaged pixel.

All simulations were performed in MATLAB 2015. The proposed algorithm works on the intensity plane. We experimented with a street video containing a moving car. The frame size of the street video is 480*720. This is a dynamic street video. Our algorithm successfully separates rain pixels and motion pixels. Our algorithm successfully reconstructs the scene. To test our algorithm, we used different videos, such as lamp video (480*504), matrix movie video (480*720) and traffic light video (480*720), as shown in Fig. 5. Rain removes the color of the traffic light in the traffic light video. The frequency of precipitation is also high. The video zoom effect is available in the intro video. Our algorithm is able to detect rain pixels and reconstruct the scene without damaging the scene. Our algorithms perform well in backlit video. The results of the intermediate stage of our algorithm are shown in Fig. 6. Interim results show that false rain detections can be suppressed after application of rain width and Prewitt operator. By reducing the number of false detections, the scene is restored correctly.

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TIJORAT BANKLARIDA KORPORATIV BOSHQARUV STANDARTLARIDAN SAMARALI FOYDALANISH YO'LLARI

Ergashev Olim Kenjayevich, Toshkent davlat iqtisodiyot universiteti, Korporativ iqtisodiyot va boshqaruv kafedrasi katta o'qituvchisi

***Annotatsiya**: Korporativ boshqaruv standartlari, ayniqsa, bugungi dinamik va murakkab moliyaviy manzara sharoitida tijorat banklarining barqarorligi va barqarorligini ta'minlashda hal qiluvchi rol o'ynaydi. Ushbu maqolada tijorat banklarida korporativ boshqaruv standartlarini samarali joriy etish bo'yicha turli strategiya va yondashuvlar o'rganilib, ularning faoliyati samaradorligi, risklarni boshqarish amaliyoti va umumiy samaradorlikni oshirishga qaratilgan. Normativ-huquqiy bazani, ilg'or tajribalarni va amaliy tadqiqotlarni o'rganib chiqqan holda, ushbu maqola tijorat banklari shaffoflik, hisobdorlik va to'g'ri qarorlar qabul qilishni kuchaytirish uchun korporativ boshqaruv standartlaridan qanday foydalanishi, pirovardida moliyaviy barqarorlikni oshirishga hissa qo'shishi haqida tushuncha beradi.*

Kalit so'zlar;Korporativ boshqaruv, Tijorat banklari, Nizom, Direktorlar kengashi, Risklarni boshqarish, Ichki nazorat, Muvofiqlik, Shaffoflik, Manfaatdor tomonlarning ishtiroki

Kirish: Korporativ boshqaruv tijorat banklarining murakkab arxitekturasida barqarorlik va mustahkamlikning asosi hisoblanadi. Global moliyaviy siljishlar va tartibga soluvchi islohotlardan keyin mustahkam boshqaruv mexanizmlari uchun imperativ hech qachon bunchalik aniq bo'lmagan. Korporativ boshqaruv