SPRAWOZDANIE

Przedmiot: TIiK

Nr laboratorium: 6

Data ćwiczeń: 20.05.2024

Autor:

Kamil Borkowski

Grupa: WCY22IY1S1

Prowadzący ćwiczenia:

mgr inż. Jerzy Dorobisz

Wnioski:

Program w języku C oblicza wartość CRC (Cyclic Redundancy Check) dla danego pliku wejściowego. CRC jest używane do wykrywania błędów w danych. Program składa się z dwóch głównych części: funkcji obliczającej CRC oraz funkcji main, która zarządza procesem wejścia/wyjścia, łączeniem zawartości plików oraz wyświetla wyniki. Program działa dla plików o różnych rozszerzeniach

Pliki wejściowe dla programu:

a.txt

b.jpg

Pliki wyjściowe dla programu :

a.CRC

a_zCRC.txt

b.CRC

b_zCRC.txt

Poniżej zamieszczam wyniki dla podanych plików.

Zawartość pliku a.txt

123456789

Zawartość pliku b.jpg

3 Image Spotting

3.1 Image Spotting using the Parametric Eigenspace

Consider an image of a scene that includes one or more of the objects that we have learned, on a complicated background. We assume that the objects are not occluded by other objects in the scene when viewed from the camera direction.

First, the search window is scanned on the whole input image area ($1 \leq x \leq X$; $1 \leq y \leq Y$) and a sequence of the subimages is made. Here, X and Y are sizes of the input image. The search window eliminates the background effect and extracts only subpart of the input images, namely, inside the object region. Each subimage is normalized respect to brightness as described in the previous section. The normalized subimage at position (x,y) is represented by vector $\mathbf{p}(x,y)$. Next, $\mathbf{p}(x,y)$ is projected into the eigenspace by

$$\mathbf{h}(x,y) = \left[\mathbf{e}_1 \cdots \mathbf{e}_k\right]^{\mathrm{T}} \mathbf{p}(x,y).$$

If this subimage belongs to the learned object, the projected point $\mathbf{h}(x,y)$ will be located on the manifold $\mathbf{g}(\theta_1, \theta_2)$. Next, we compute the distance between the projected point and the manifold, using:

$$d(x,y) = \min_{\theta_1, \theta_2} \left\| \mathbf{h}(x,y) - \mathbf{g}(\theta_1, \theta_2) \right\|.$$

If the distance $d(x,y)$ is less than some pre-determined threshold value, the position (x,y) is a candidate for the object. After finding the candidate, the minimum peak of the distance around this position is searched, because the distance of the subimage at (x,y) is similar to that of the subimage around this position since these images are correlated to each other. Finally, we can conclude that the position that minimizes the distance is of the object. The pose and size parameters can be estimated by the parameters θ_1 and θ_2 that minimize the distance.

Wynik dla pliku: a.txt

```
Poczatkowe wartosci bajtow wielomianu
1. bajt wielomianu ma wartosc - 0x4
2. bajt wielomianu ma wartosc - 0xc1
3. bajt wielomianu ma wartosc - 0x1d
4. bajt wielomianu ma wartosc - 0xb7
Podaj nazwe pliku wraz z rozszerzeniem do obliczenia CRC
a.txt
Plik zawiera 9 bajtow
Obliczone CRC:
1. bajt wielomianu ma wartosc - 0x89
2. bajt wielomianu ma wartosc - 0xa1
3. bajt wielomianu ma wartosc - 0x89
4. bajt wielomianu ma wartosc - 0x7f
Wartosc CRC zapisano w pliku: a.CRC
Dodano plik wejsciowy do a_zCRC.txt
Dodano CRC do a_zCRC.txt

Process returned 0 (0x0)   execution time : 4.253 s
Press any key to continue.
```

Wynik dla pliku: b.jpg

```
 "C:\Users\Kamil\Desktop\Stary Folder\studia_git\TliK\lab6_tiik\KB_Lab6.exe"
Poczatkowe wartosci bajtow wielomianu
1. bajt wielomianu ma wartosc - 0x4
2. bajt wielomianu ma wartosc - 0xc1
3. bajt wielomianu ma wartosc - 0x1d
4. bajt wielomianu ma wartosc - 0xb7
Podaj nazwe pliku wraz z rozszerzeniem do obliczenia CRC
b.jpg
Plik zawiera 109847 bajtow
Obliczone CRC:
1. bajt wielomianu ma wartosc - 0x20
2. bajt wielomianu ma wartosc - 0x2c
3. bajt wielomianu ma wartosc - 0x3d
4. bajt wielomianu ma wartosc - 0x2d
Wartosc CRC zapisano w pliku: b.CRC
Dodano plik wejsciowy do b_zCRC.jpg
Dodano CRC do b_zCRC.jpg

Process returned 0 (0x0)   execution time : 2.442 s
Press any key to continue.
```

Zawartość pliku a.CRC

‰˘‰

Zawartość pliku a_zCRC:

123456789‰˘‰

Zawartość pliku b.CRC

,=-

Zawartość pliku b_zCRC:

3 Image Spotting

3.1 Image Spotting using the Parametric Eigenspace

Consider an image of a scene that includes one or more of the objects that we have learned, on a complicated background. We assume that the objects are not occluded by other objects in the scene when viewed from the camera direction.

First, the search window is scanned on the whole input image area ($1 \le x \le X$; $1 \le y \le Y$) and a sequence of the subimages is made. Here, X and Y are sizes of the input image. The search window eliminates the background effect and extracts only subpart of the input images, namely, inside the object region. Each subimage is normalized respect to brightness as described in the previous section. The normalized subimage at position (x, y) is represented by vector $\mathbf{p}(x, y)$. Next, $\mathbf{p}(x, y)$ is projected into the eigenspace by

$$\mathbf{h}(x, y) = \left[\mathbf{e}_1 \cdots \mathbf{e}_k \right]^{\mathrm{T}} \mathbf{p}(x, y).$$

If this subimage belongs to the learned object, the projected point $\mathbf{h}(x, y)$ will be located on the manifold $\mathbf{g}(\theta_1, \theta_2)$. Next, we compute the distance between the projected point and the manifold, using:

$$d(x, y) = \min_{\theta_1, \theta_2} \left\| \mathbf{h}(x, y) - \mathbf{g}(\theta_1, \theta_2) \right\|.$$

If the distance $d(x,y)$ is less than some pre-determined threshold value, the position (x,y) is a candidate for the object. After finding the candidate, the minimum peak of the distance around this position is searched, because the distance of the subimage at (x,y) is similar to that of the subimage around this position since these images are correlated to each other. Finally, we can conclude that the position that minimizes the distance is of the object. The pose and size parameters can be estimated by the parameters θ_1 and θ_2 that minimize the distance.