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(1)-

(2)

2003/05/22

2003/08/14

16

- (*Carpet Design System*) CDS

(*Photoshop*)

CDS

.()

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.CDS

185

*Use of Quantification for the Extraction of
Fundamental Colors in an image*
«Application on carpet image»

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ABSTRACT

The topic of this research aims at minimizing carpet image color number (acquired by a scanner) from 16 million colors to 5 colors, in order to restore the shapes of the original image automatically without distortions.

For this purpose an algorithm was developed for the application called CDS (Carpet Design System)- which is an application developed locally for use in sewing carpets in General Institution of Texture Factory in Syria-, but the results are still not acceptable, because the resulting images have a lot of distortions, and they need some processing using an image processing application (ex. Photoshop). This task needs more than tow weeks.

In this research work, we study the CDS algorithm, and other color quantification algorithms, developed in research laboratories specialized in image processing. We apply this algorithms on carpet images, after doing the necessary modifications for tuning and adapting to our special problem. Finally we compare the results, and suggest the best solution for the problem.

Key Words: Image processing, Carpet image, Color quantification algorithms, CDS algorithm.

: .1

pixel : [2] pixel •

() pixels : _____ •

: [6] •

: [4](Carpet Design System) CDS .2

: .1-2

: CDS .2-2

256

256

CDS

: CDS .3-2

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-(1)

-(2)

≤ -1-(2)

(3 2 1)

-2-(2)

: _____ .2-3

CDS

: .4

8

(16) 24

(256)

.[6]

:[5] .5

:

:_____

:_____

:_____ .1-5

) (RGB) -1

.(

-2

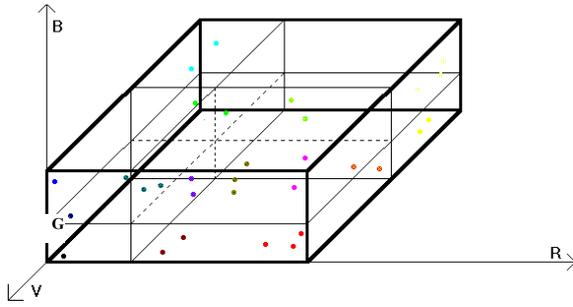
:_____ (*RGB*) _____ .1-1-5

:

. [7] (Median-Cut) - 1

. [7] (Wu) - 2

(1)

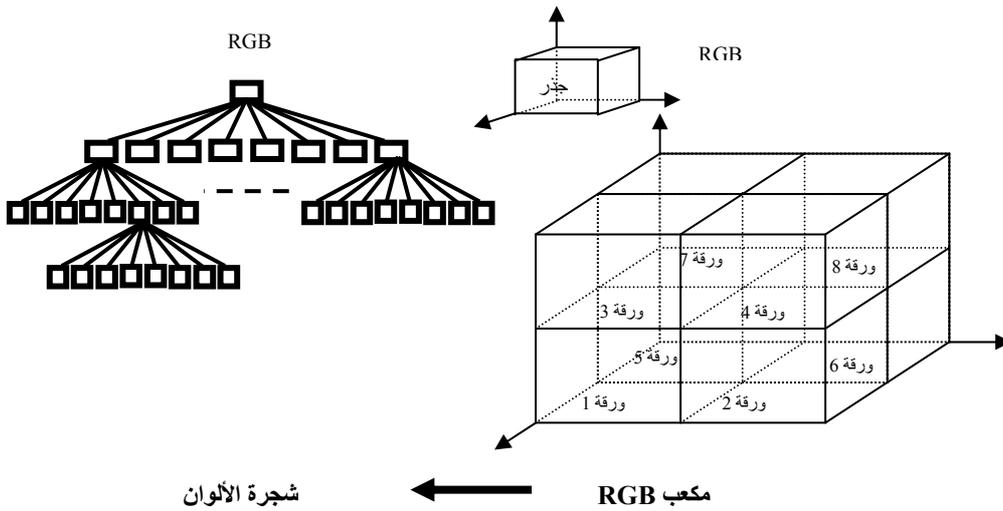


(1)

: [8] . 2-1-5

pixels . (2)

OcTree . (OcTree)



(2)

: _____ .2-5

:

.(CDS) -1
-2

:[10 ,9] _____ .1-2-5
3

Neuquant

.(3-3) : (CDS) _____ .2-2-5
CDS

: .6

() _____

16

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- - •
•
CDS •
.CDS •
! : CDS
: .7

.1-7

: (Visual C++) C++ •
•
C VC++ •
CDS •
CDS

.2-7

: (24) 16 -1
.() -2
-3

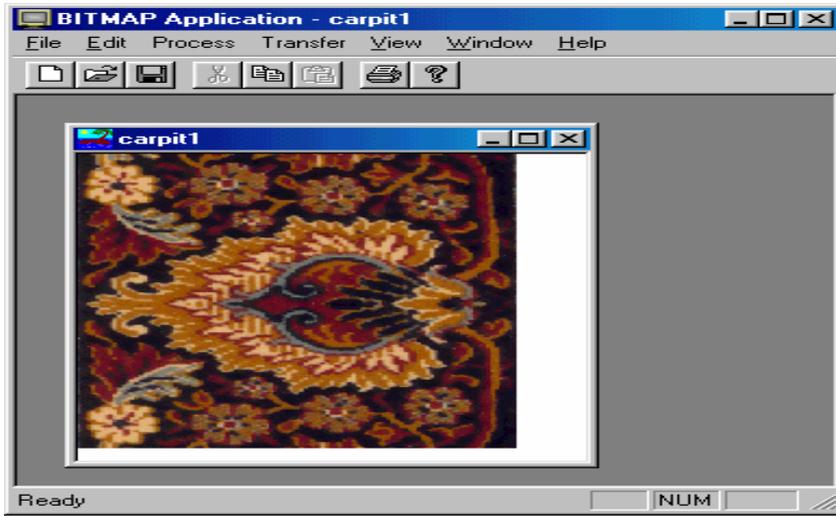
MFC AppWizard

VC++

(exe)

(Microsoft Foundation Class) MFC

(3)



(3)

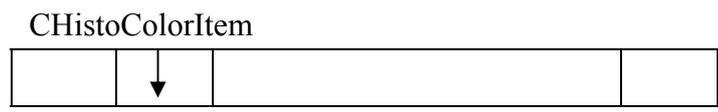
```

: _____ :CHistoItem -1
                .count: •
                .probability: •
                .index : •
                inc() : _____
CHistoItem      :CHistoColorItem -2
                .color _____
CHistoItem      :CHistoChannellItem -3
.s_equal        channel : _____
    
```

⁴*CDocument* :*CDibDoc* -4
MFC

- :
: *LockImage* •
- : *UnlockImage* •
- Pixel : *GetPixel* •
- Pixel : *SetPixel* •
- : *GetHistoColorArray* •
- : *GetHistoChannelArray* •
- : *RunFirstChange* •
- : *BinarySearch* •
-

CHistoColorArray
: *CHistoColorItem*



CHistoChannelArray
CHistoColorArray
.CHistoChannellItem

:
: *Wu Median-Cut* - -
-1- -

	-2-一
.(⁵ COLORREF)	-3-一
.	-4-一
. index	-二
. <u>:Neuquant</u>	-1-二
.	-2-二
.	-3-二
. <u>:CDS</u>	-三
.	-1-三
.	-2-三
. (COLORREF)	-3-三
. index	OcTree
.	:
.	.3-7
.	:
. Neuquant	-(1
. Wu	-(2
. CDS	-(3

(5) 6 . *.Median-Cut* -(4
 (4)
 (30)

:
.Neuquant -(1
.CDS -(2
.Wu -(3
.Median-Cut -(4

. *CDS* : .8

CDS
Photoshop
CDS *Neuquant* *CDS*
Neuquant

: .9

pixels *pixel* (*pixels*)
pixels

.(

:



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(4)

() .*Wu*

CDS

() .

() .*Median-Cut*

CDS

() .

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() .*Neuquant*

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(VIII)

(5)

() .*Wu*

() .*Median-Cut*
CDS

() . ()
() .*Neuquant*

CDocument Class Members

Construction

CDocument	Constructs a CDocument object.
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Operations

AddView	Attaches a view to the document.
GetDocTemplate	Returns a pointer to the document template that describes the type of the document.
GetFirstViewPosition	Returns the position of the first in the list of views; used to begin iteration.
GetNextView	Iterates through the list of views associated with the document.
GetPathName	Returns the path of the document's data file.
GetTitle	Returns the document's title.
IsModified	Indicates whether the document has been modified since it was last saved.
RemoveView	Detaches a view from the document.
SetModifiedFlag	Sets a flag indicating that you have modified the document since it was last saved.
SetPathName	Sets the path of the data file used by the document.
SetTitle	Sets the document's title.
UpdateAllViews	Notifies all views that document has been modified.

Overridables

CanCloseFrame	Advanced overridable; called before closing a frame window viewing this document.
DeleteContents	Called to perform cleanup of the document.
OnChangedViewList	Called after a view is added to or removed from the document.
OnCloseDocument	Called to close the document.
OnNewDocument	Called to create a new document.
OnOpenDocument	Called to open an existing document.
OnSaveDocument	Called to save the document to disk.
ReportSaveLoadException	Advanced overridable; called when an open or save operation cannot be completed because of an exception.
GetFile	Returns a pointer to the desired CFile object.
ReleaseFile	Releases a file to make it available for use by other applications.
SaveModified	Advanced overridable; called to ask the user whether the document should be saved.
PreCloseFrame	Called before the frame window is closed.

Mail Functions

OnFileSendMail	Sends a mail message with the document attached.
OnUpdateFileSendMail	Enables the Send Mail command if mail support is present.

