TDICOMDecoder

for Borland Delphi &C++ Builder

User Manual

1998-2006 HongDi science & technology development co.,ltd. of Huzhou,ZheJiang,China

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Crystal

TDICOMDecoder for Delphi&C++Builder

**1998-2006 HongDi science & technology development co.,ltd.
of Huzhou,ZheJiang,China**

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hongbin.fei

jun.shi

Cover Designer

hongbin.fei

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hongbin.fei

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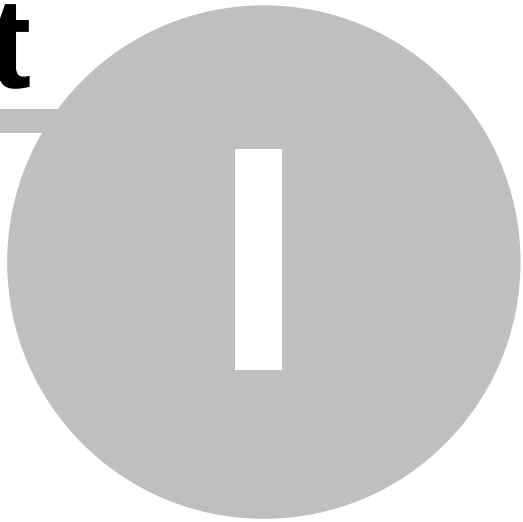
Part



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Part II

2 Introduction

2.1 What is TDICOMDecoder

TDICOMDecoder can read (DICOM30,ACRNEMA20,ACRNEMA10) DICOM files, you can easy to get information from it. Include the image.

2.2 Files list

TDICOMDecoder??.bpk

The package in delphi or c++ builder format.

DICOMDecoderReg.pas
It can register TDICOMDecoder into delphi or c++ builder.

DICOMDecoder.pas
it is main file of this decoder.

DICOMDefines.pas
type defining .

DICOMDictionary.pas
it is a dictionary file, include groups and elements from DICOM3.0

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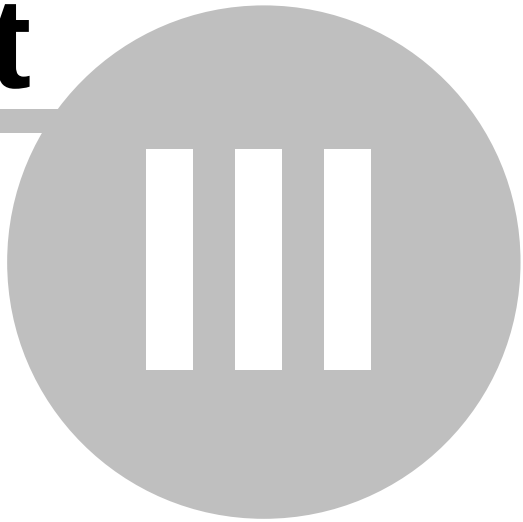
Part



3 Defines

```
type


 UID   =string[63];
 UINT  = Cardinal ;
 UINT8 = BYTE ;
 UINT16= WORD ;
 UINT32= LONGWORD;
 INT8  = SHORTINT;
 INT16 = SMALLINT;
 INT32 = LONGINT;
 INT   = INTEGER ;
 T2Char =  Array[0..1] of Char;
 T3Char =  Array[0..2] of Char ;
 T4Char =  Array[0..3] of Char ;
 T64Char =  Array[0..63] of Char ;



TYPE
  TRGBTripleArray = ARRAY[WORD] OF TRGBTriple;
  pRGBTripleArray = ^TRGBTripleArray;

type
 TFileType =(DICOM30,ACRNEMA20,ACRNEMA10,UNKNOW);
 TItemEndMode = (WantSQEnd,WantLengthEnd);
 TDataSet = record
   Group  : UINT16;
   Element: UINT16;
   VR     : T2Char; // if VR='SQ' Value:point address
   Length : UINT32;
   Value :PChar;
 end;


const
   UID_IMPL_VR_LE_TRANSFER_SYNTAX :UID  = '1.2.840.10008.1.2'; //Default transfersyntax
   UID_IMPL_VR_BE_TRANSFER_SYNTAX :UID  = 'ONLY FOR ACR-NEMA10'; //CREATE BY FHB

   UID_EXPL_VR_LE_TRANSFER_SYNTAX:UID   = '1.2.840.10008.1.2.1';
   UID_EXPL_VR_BE_TRANSFER_SYNTAX :UID  = '1.2.840.10008.1.2.2';
   UID_APPLICATION_CONTEXT  :UID     = '1.2.840.10008.3.1.1.1';

type
  TDict = Record
     Group :  UINT16;
     Element: UINT16;
     VR     : T2Char;
     Name   : ShortString;
 end;

sample:
  TheDict : array [0..MAX_RECORD]{More} of TDict = (
       (Group:$0; Element:$0;VR:'UL';Name:'GroupLength'),
       (Group:$0; Element:$2;VR:'UI';Name:'AffectedSOPClassUID'),
       (Group:$0;Element:$0003;VR:'UI';Name:'RequestedSOPClassUID'),
       (Group:$0;Element:$0100;VR:'US';Name:'CommandField'),
```

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Part IV

4 TDICOMDecoder

It is a class of link line shape, it defines properties ,events,methods.

4.1 Methods

4.1.1 Create

constructor Create(); override;

Description:

Constructor Create overrides the inherited Create. First inherited Create is called, then the internal data structure is initialized.

4.1.2 CreateBmp

procedure CreateBmp(ABitmap:TBitmap;AMin:integer=0;AMax:integer=0);

Description:

To generate a bitmap file .
AMin is min value for color;
AMax is max value for color;
if AMin and AMax all is zero, TDICOMDecoder will use the the value in dicom file stored!

this procedure are useful for ajust WindowWidth and WindowCenter!

See Also:

Defines

4.1.3 Destory

destructor Destroy;

Description:

Destroy the instance of TDCIOMDecoder,release all memory allocated

4.1.4 GetDICOMPara

procedure GetDICOMPara**;**

Description:
To get this value by this procedure.

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```
_FrameCount:byte;
 _FrameIndex:byte;
 _BitsAllocated:byte;
 _BitsStored :byte;
 _HighBit :byte;
_Rows,_Cols:integer;
 _Samples_Pre_Pixel:integer;
 _Planar:integer;
 _Pixel_Rep:integer;
 _PhotoMetric:String;
 _WindowWidth:double;
_WindowCenter:double;
_ColorByPlane:boolean;
_RescaleIntercept: Single;
_RescaleSlope: Single;
_PixelSpacingX: Single;
_MaxPixelValue:integer;
_MinPixelValue:integer;
_Pixelsdata:pchar;

  _PatientName :string ;
    _PatientID :string;
         _Sex :string;
    _StudyDate : string;
_InstitutionName :string;
```

4.1.5 GetDSCount

function GetDSCount():integer;

Description:

it return how many dataset in the current file.

Example(BCB):

```
for ( int i=0;i< DICOMDecoder1->GetDSCount()-1 ;i++)
 {
     StringGrid1->RowCount = StringGrid1->RowCount+1;
     StringGrid1->Cells[0][i] =  DICOMDecoder1->GetValueAll(DICOMDecoder1->DataSets[i]);
  }
```

See Also:

Defines

4.1.6 GetValueAll

function GetValueAll(ADataSet:TDataSet):String;

Description:

it return the string for DataSet Value.

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Example(BCB):

```
 for ( int i=0;i< DICOMDecoder1->GetDSCount()-1 ;i++)
  {
      StringGrid1->RowCount = StringGrid1->RowCount+1;
      StringGrid1->Cells[0][i] =  DICOMDecoder1->GetValueAll(DICOMDecoder1->DataSets[i]);
   }
```

See Also:

Defines
GetDSCount

4.1.7 OpenFile

procedure OpenFile(TheFileName:String);

Description:

try open a file.

code sample:

```
void __fastcall TForm1::BitBtn1Click(TObject *Sender)
{
  if (OpenDialog1->Execute())
  {
    DICOMDecoder1->OpenFile(OpenDialog1->FileName);
 if (DICOMDecoder1->Read()!=UNKNOW)
 {


    Label1->Caption=DICOMDecoder1->_PatientName+' '+DICOMDecoder1->_Sex;
    Label2->Caption=DICOMDecoder1->_PatientID;
 .....
}
```

4.1.8 Read

function Read:TFileType;

Description:

it read a DICOM file and store the information(Group,Element,VR,Value) to dataset array.

code sample:

```
void __fastcall TForm1::BitBtn1Click(TObject *Sender)
{
  if (OpenDialog1->Execute())
  {
    DICOMDecoder1->OpenFile(OpenDialog1->FileName);
 if (DICOMDecoder1->Read()!=UNKNOW)
 {


    Label1->Caption=DICOMDecoder1->_PatientName+' '+DICOMDecoder1->_Sex;
    Label2->Caption=DICOMDecoder1->_PatientID;
 .....
}
```

See Also:

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Defines

4.1.9 To Get other value from dataset

```
function  GetLO(G,E:UINT16):String;
 function  GetPN(G,E:UINT16):String;
 function  GetCS(G,E:UINT16):String;
 function  GetDA(G,E:UINT16):String;
 function  GetUS(G,E:UINT16):string;
 function  GetDS(G,E:UINT16):String;
 function  GetUnsignedInteger(a:string):UINT;
 function  GetInteger(a: string): INT16;
 function  GetFloatSingle(a:string):Single;
 function  GetFloatDouble(a:string):double;

 function  GetPixels(G,E:UINT16):PChar;
 function  GetValueSS(ADataSet:TDataSet):UID;
```

Code like this:

```
    _PatientName := GetPN($0010,$0010) ;

$0010,$0010 is group and element
GetPN, the PN is VR,
    VR := FindVR( Group , Element ); // (  VR : T2Char)
   sometime you need find VR in dictionary
```

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Part V

5 About Crystal Component

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