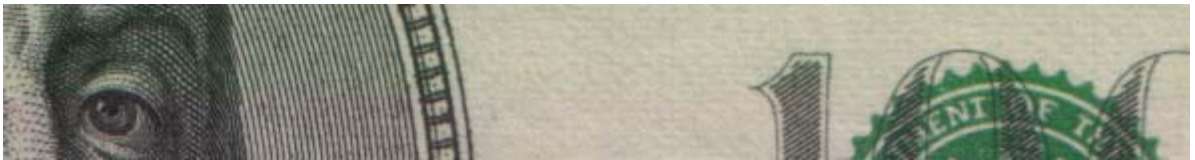


```
In[27]:= (* Counterfeit Detection Based on Ink Color *)
(* Copyright May 2,
2006 Doug Youvan www.youvan.com www.pseudocolor.com *)

Clear [benslice];
benslice = Import["D:\\Mathematica\\Data\\benslice2.jpg"];
(* The top half of benslice2 has been adjusted in PS as +
14 green with constant luminosity *)
Export ["D:\\Mathematica\\Data\\benslice.tif", benslice];
benslice = Import["D:\\Mathematica\\Data\\benslice.tif"];
benslice = benslice /. Graphics -> List;
pixelvalues = benslice[[1, 1]];
pv = pixelvalues / 255;
size = Dimensions[pv];
width = size[[2]];
height = size[[1]];
Show[Graphics[RasterArray[Apply[RGBColor, pv, {2}]]],
ImageSize -> {width, height}, AspectRatio -> Automatic];
```



```
(* Single image output *)

newrgbpixels = {pv[[Random[Integer, {1, height}], Random[Integer, {1, width}]]],
  pv[[Random[Integer, {1, height}], Random[Integer, {1, width}]]],
  pv[[Random[Integer, {1, height}], Random[Integer, {1, width}]]]};
inv = Inverse[newrgbpixels];
ortho = pv.inv;
gortho = Graphics[RasterArray[Apply[RGBColor, ortho, {2}]],
  AspectRatio -> Error, ImageSize -> {width, height}];

(* AspectRatio is flakey; must trip error to get correct export *)

Show[gortho];
Export["D:\\Mathematica\\Data\\gortho.gif",
  gortho, "GIF", ImageSize -> {width, height}];

(* Exporting as 288 x 34, regardless of gif, tif, jpg format *)
```

```
General::spell1 :
Possible spelling error: new symbol name "gortho" is similar to existing symbol "ortho". More...

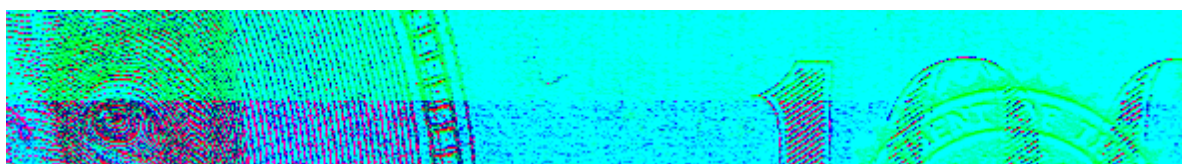
AspectRatio::aspr :
Value of option AspectRatio -> Error is not a finite positive number or Automatic. More...

Graphics::realu :
Argument in RGBColor[ $\frac{19565}{7921}$ ,  $-\frac{12704}{7921}$ ,  $\frac{9349}{7921}$ ] is not a real number between 0 and 1. More...

Graphics::realu :
Argument in RGBColor[ $\frac{19565}{7921}$ ,  $-\frac{12704}{7921}$ ,  $\frac{9349}{7921}$ ] is not a real number between 0 and 1. More...

Graphics::realu :
Argument in RGBColor[ $\frac{19565}{7921}$ ,  $-\frac{12704}{7921}$ ,  $\frac{9349}{7921}$ ] is not a real number between 0 and 1. More...

General::stop : Further output of Graphics::realu will be suppressed during this calculation. More...
```



```
AspectRatio::aspr :
Value of option AspectRatio -> Error is not a finite positive number or Automatic. More...

AspectRatio::aspr :
Value of option AspectRatio -> Error is not a finite positive number or Automatic. More...

Graphics::realu :
Argument in RGBColor[ $\frac{19565}{7921}$ ,  $-\frac{12704}{7921}$ ,  $\frac{9349}{7921}$ ] is not a real number between 0 and 1. More...

Graphics::realu :
Argument in RGBColor[ $\frac{19565}{7921}$ ,  $-\frac{12704}{7921}$ ,  $\frac{9349}{7921}$ ] is not a real number between 0 and 1. More...

Graphics::realu :
Argument in RGBColor[ $\frac{19565}{7921}$ ,  $-\frac{12704}{7921}$ ,  $\frac{9349}{7921}$ ] is not a real number between 0 and 1. More...

General::stop : Further output of Graphics::realu will be suppressed during this calculation. More...
```

In[44]:=

```
(* looped for 26 images to be output
and then assembled in an animation program *)

name = Table[i, {i, 1, 51}];

For[i = 1, i < 26,

  newrbpixels = {pv[[Random[Integer, {1, height}], Random[Integer, {1, width}]]],
    pv[[Random[Integer, {1, height}], Random[Integer, {1, width}]]],
    pv[[Random[Integer, {1, height}], Random[Integer, {1, width}]]]};
  inv = Inverse[newrbpixels];
  ortho = pv . inv; gortho = Graphics[RasterArray[Apply[RGBColor, ortho, {2}]],
    AspectRatio -> Error, ImageSize -> {width, height}];
  Show[Graphics[gortho]];
  Export["D:\\Mathematica\\Data\\" <> ToString[name[[i]]] <> ".gif",
    gortho, "GIF", ImageSize -> {width, height}];

  i++];

(* Exporting as 288 x 34 *)
```

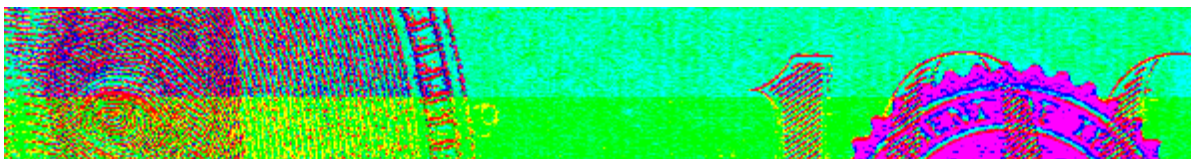
```
AspectRatio::aspr :
Value of option AspectRatio -> Error is not a finite positive number or Automatic. More...

Graphics::realu :
Argument in RGBColor[ $\frac{8795}{6449}$ ,  $\frac{20698}{6449}$ ,  $-\frac{10972}{6449}$ ] is not a real number between 0 and 1. More...

Graphics::realu :
Argument in RGBColor[ $\frac{8795}{6449}$ ,  $\frac{20698}{6449}$ ,  $-\frac{10972}{6449}$ ] is not a real number between 0 and 1. More...

Graphics::realu :
Argument in RGBColor[ $\frac{8795}{6449}$ ,  $\frac{20698}{6449}$ ,  $-\frac{10972}{6449}$ ] is not a real number between 0 and 1. More...

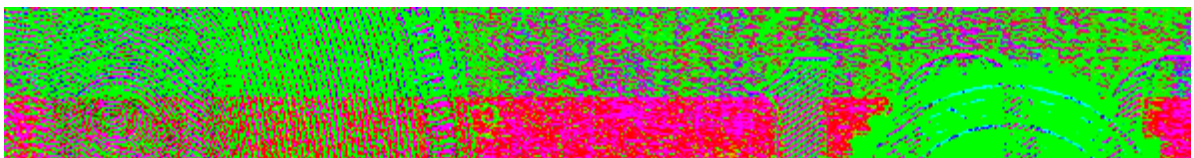
General::stop : Further output of Graphics::realu will be suppressed during this calculation. More...
```



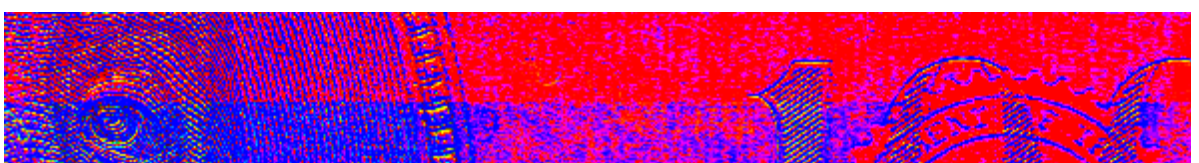
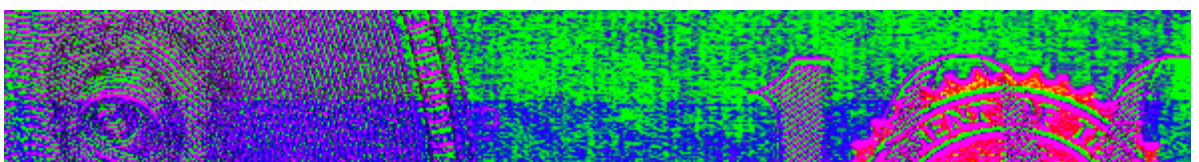
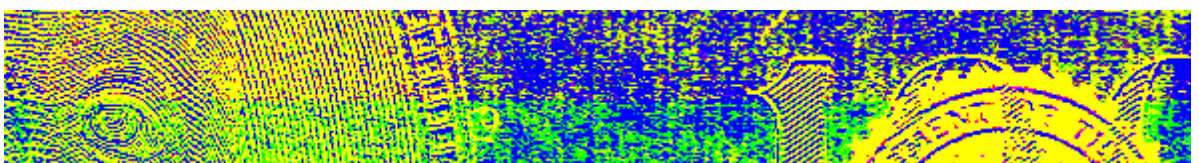
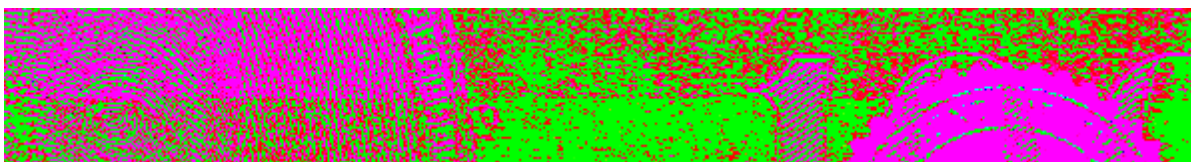
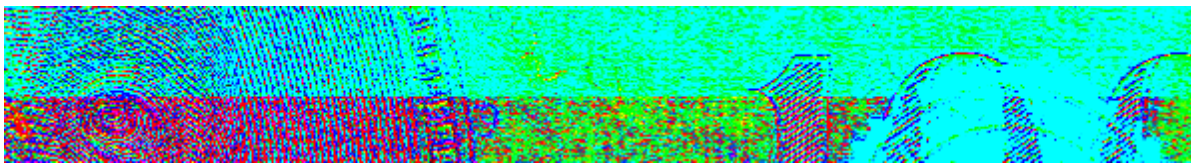
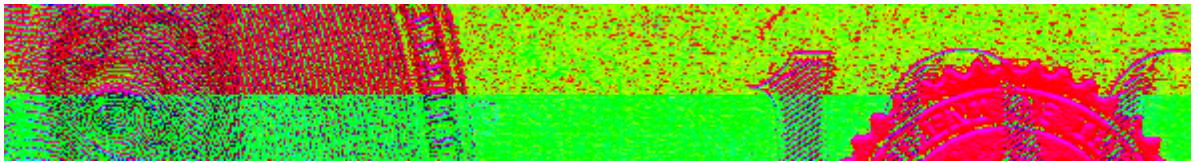
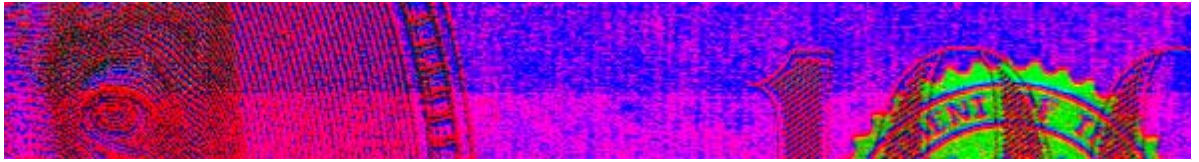
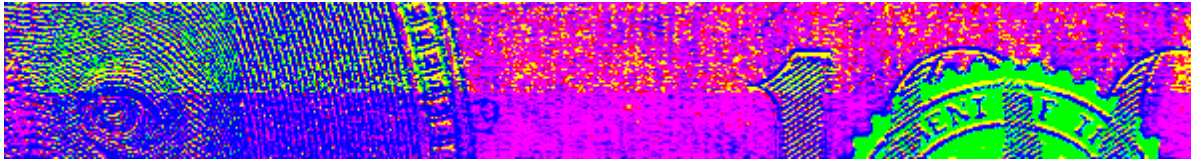
```
AspectRatio::aspr :
Value of option AspectRatio -> Error is not a finite positive number or Automatic. More...

AspectRatio::aspr :
Value of option AspectRatio -> Error is not a finite positive number or Automatic. More...

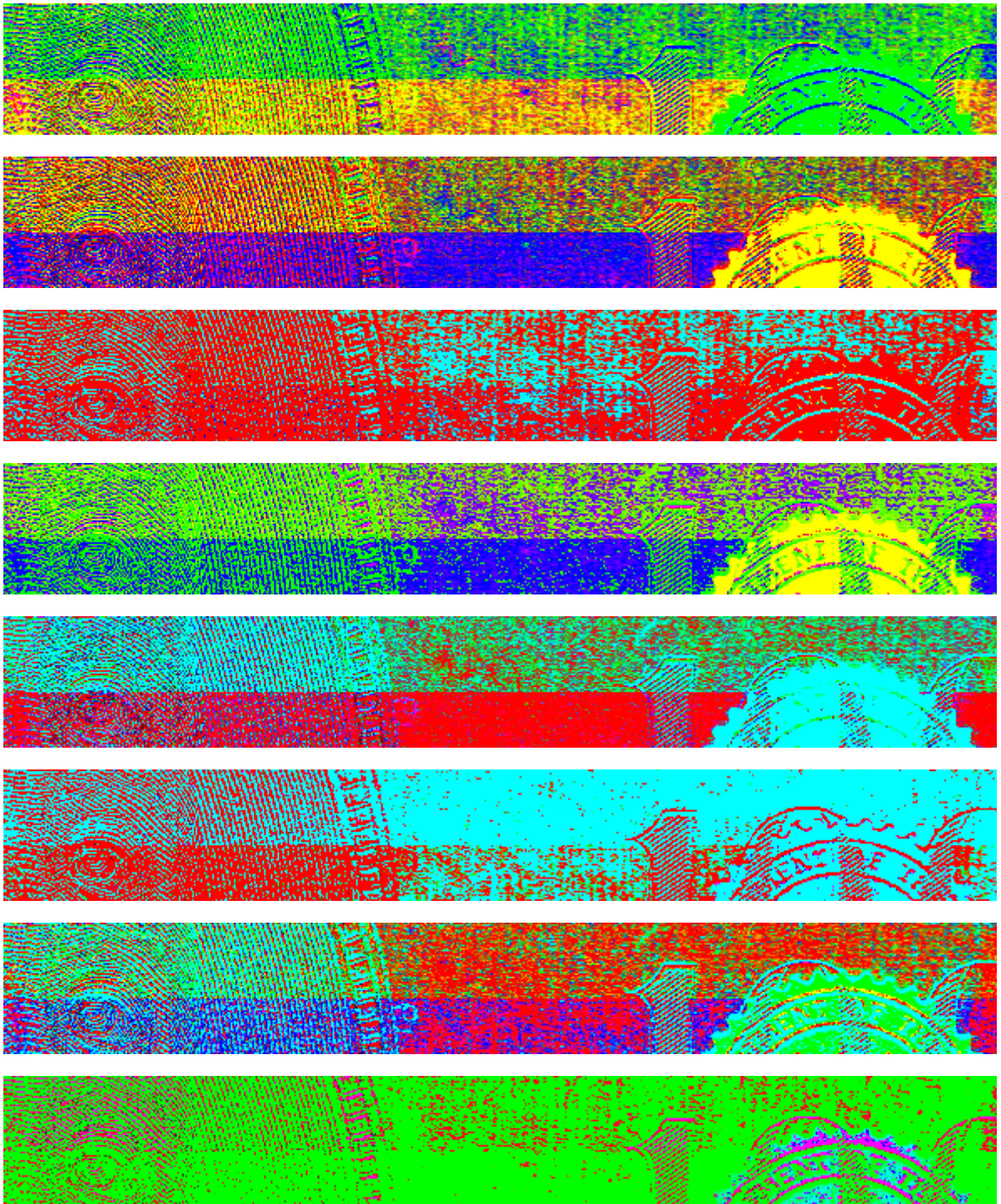
General::stop : Further output of AspectRatio::aspr will be suppressed during this calculation. More...
```











Inverse::sing : Matrix  $\left\{\left\{\frac{202}{255}, \frac{197}{255}, \frac{35}{51}\right\}, \left\{\frac{196}{255}, \frac{191}{255}, \frac{169}{255}\right\}, \left\{\frac{61}{255}, \frac{61}{255}, \frac{61}{255}\right\}\right\}$  is singular. More...

RasterArray::matrix :

Argument  $\left\{\text{RGBColor}\left[\left\{\frac{161}{255}, \frac{48}{85}, \frac{152}{255}\right\}, \left\{\frac{54}{85}, \frac{164}{255}, \frac{53}{85}\right\}, \left\{\frac{163}{255}, \frac{32}{51}, \frac{151}{255}\right\}, \left\{\frac{54}{85}, \frac{52}{85}, \frac{48}{85}\right\}, \left\{\frac{154}{255}, \frac{11}{17}, \frac{148}{255}\right\}, \left\{\langle\langle 1 \rangle\rangle\right\}, \left\{\langle\langle 1 \rangle\rangle\right\}, \left\{\frac{7}{15}, \frac{104}{255}, \frac{25}{51}\right\}, \left\{\frac{54}{85}, \frac{53}{85}, \frac{154}{255}\right\}, \left\{\frac{58}{85}, \frac{2}{3}, \frac{53}{85}\right\}, \langle\langle 636 \rangle\rangle\right\}, \langle\langle 10 \rangle\rangle\right\}$ .  $\langle\langle 1 \rangle\rangle$  at position 1 is not a nonempty rectangular matrix. More...



RasterArray::matrix :

```
Argument {RGBColor[{ $\frac{161}{255}$ ,  $\frac{48}{85}$ ,  $\frac{152}{255}$ }, { $\frac{54}{85}$ ,  $\frac{164}{255}$ ,  $\frac{53}{85}$ }, { $\frac{163}{255}$ ,  $\frac{32}{51}$ ,  $\frac{151}{255}$ }, { $\frac{54}{85}$ ,  $\frac{52}{85}$ ,  $\frac{48}{85}$ }, { $\frac{154}{255}$ ,  $\frac{11}{17}$ ,  $\frac{148}{255}$ },  
{<<1>>}, {<<1>>}, { $\frac{7}{15}$ ,  $\frac{104}{255}$ ,  $\frac{25}{51}$ }, { $\frac{54}{85}$ ,  $\frac{53}{85}$ ,  $\frac{154}{255}$ }, { $\frac{58}{85}$ ,  $\frac{2}{3}$ ,  $\frac{53}{85}$ }, <<636>>], <<10>>}.<<1>>
```

at position 1 is not a nonempty rectangular matrix. MORE...

