

DeBlurring

In the first problem of the DeBlurring unit, we give you a blurred image and the corresponding PSF matrix. You will use RestoreTools to reconstruct the image. In the second problem, YOU will come up with a PSF, then try the reconstruction.

First you need to load the data on your computer. To do this, use the `load` command.

```
>> load DeBlur
```

Now use the `whos` command to see what you just loaded. You should see `Cblur`, `Ctrue`, `PSF` and `DenverBlur`. The first three will be used for the first problem. `DenverBlur` is used in problem two.

Problem 1 *Type in the following MATLAB code. It may take a while for the computer to do the last line. Be patient.*

```
>> imshow(Cblur, [])
>> A = psfMatrix(PSF);
>> C = CGLS(A, Cblur, Cblur, 30);
```

Can you tell what the blurred image is? It belongs in the desert. CGLS is an iterative method that is used to reconstruct the image. A describes the PSF matrix and 30 tells it to do 30 iterations. How does the image at the 30th iteration look? Are the images at each iteration getting better? Can you tell what it is yet?

Problem 2 *To get rid of all the images from problem 1, use the command `close all`. Then use `clear` to clear the memory. Type:*

```
>> load DeBlur
>> imshow(DenverBlur, [])
```

Is the blur a left or right motion blur? Create a kernel matrix, K that you think represents that type of blur. Use the following commands to see if your K works well.

```
>> I = DenverBlur;
>> K = type here the kernel you think works
>> A = psfMatrix(K);      (where K is the kernel you think caused the blur)
>> C = CGLS(A, I, I, 10);
```

You may want to play around with the number of iterations.