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Fresh Start

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Class: ECE 563-01

Purpose: Looking at the equations dealing with the analysis of certain input parameters in the optical world.

```
clc; clear all; close all;
```

Specification

Test your function with the input parameters listed below and report your output. You should write a script file to set the input parameters below, call the new function, and display the output structure to the command window. Name this “test_optical_parameters.m” to complement your functionthat should be in its own file called “optical_parameters.m” Publish the script to a .pdf file and upload the .pdf and your “optical_parameters.m” function file to Isidore. The published script should show your inputs and your outputs.

Code

```
% set all input parameters
opt.wavelength = 0.50e-6 % meters
opt.focal_length = 8e-3  % meters
opt.f_number = 8         % F/# (# = 8)
opt.fpa_pitch = 5.4e-6   % meters
opt.fpa_size = 6.4e-3    % meters
opt.distance = 5         % meters

% run the test script.
post_opt = optical_parameters(opt)

% end of test_optical_parameters.m
```

```
opt =

  struct with fields:

    wavelength: 5.0000e-07


opt =
```

```
  struct with fields:

      wavelength: 5.0000e-07
    focal_length: 0.0080


opt =

  struct with fields:

      wavelength: 5.0000e-07
    focal_length: 0.0080
        f_number: 8


opt =

  struct with fields:

      wavelength: 5.0000e-07
    focal_length: 0.0080
        f_number: 8
       fpa_pitch: 5.4000e-06


opt =

  struct with fields:

      wavelength: 5.0000e-07
    focal_length: 0.0080
        f_number: 8
       fpa_pitch: 5.4000e-06
        fpa_size: 0.0064


opt =

  struct with fields:

      wavelength: 5.0000e-07
    focal_length: 0.0080
        f_number: 8
       fpa_pitch: 5.4000e-06
        fpa_size: 0.0064
        distance: 5


post_opt =

  struct with fields:

          wavelength: 5.0000e-07
        focal_length: 0.0080
```

```
            f_number: 8
           fpa_pitch: 5.4000e-06
            fpa_size: 0.0064
            distance: 5
            aperture: 1.0000e-03
       cutoff_focal: 250000
     cutoff_angular: 2.0000e+03
      cutoff_object: 400.0000
     image_distance: 0.0080
      magnification: -0.0016
        angular_fov: 0.7610
        spatial_fov: 3.9936
 sampling_frequency: 1.8519e+05
      Nyquist_pitch: 2.0000e-06
      undersampling: 2.7000
         pix2object: 1.3500e-08
```

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