

EECS 331: Introduction to Computational Photography

HW3: High Dynamic Imaging and Tone-mapping

1. Write an Auto Exposure Bracketing (AEB) function for Tegra

Android program ‘backbone’ was modified to fulfil the given conditions.

Minimum Exposure of Tegra: 33600 ns

Maximum Exposure of Tegra: 358732928 ns

Multiple images of a scene are captured and the exposure times recorded.
The following are a few images of the scenes:

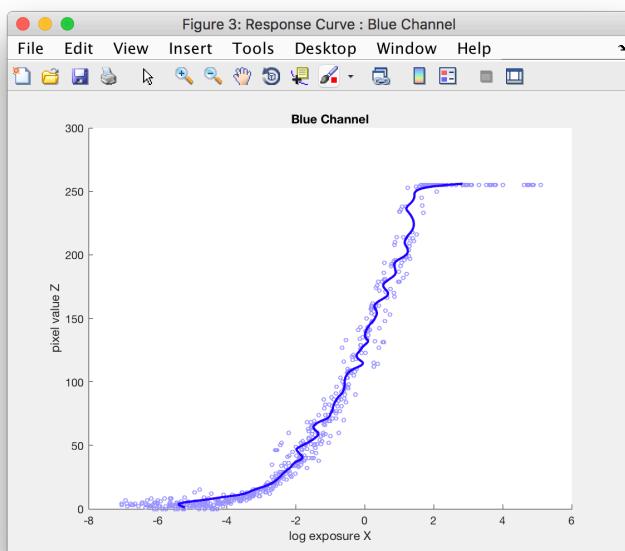
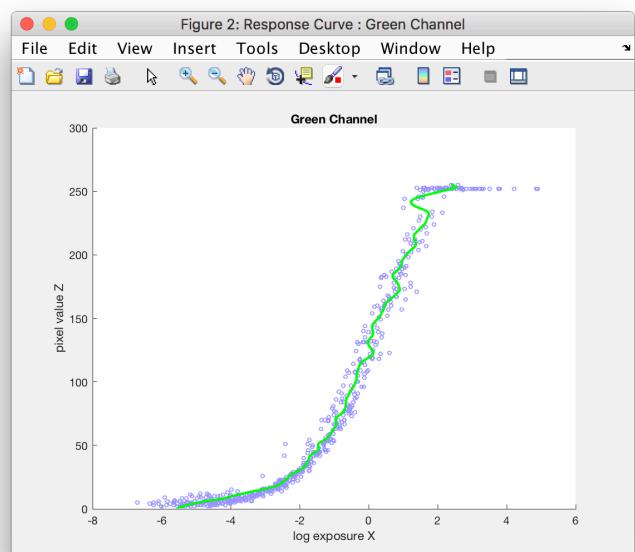
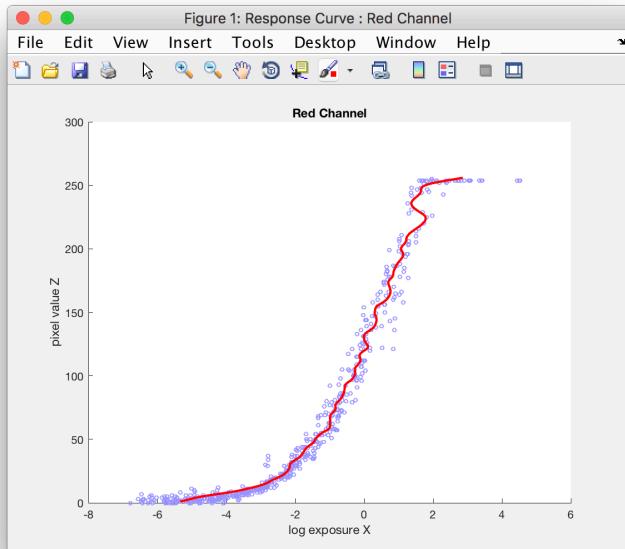


Fig 0: Samples of chosen scene

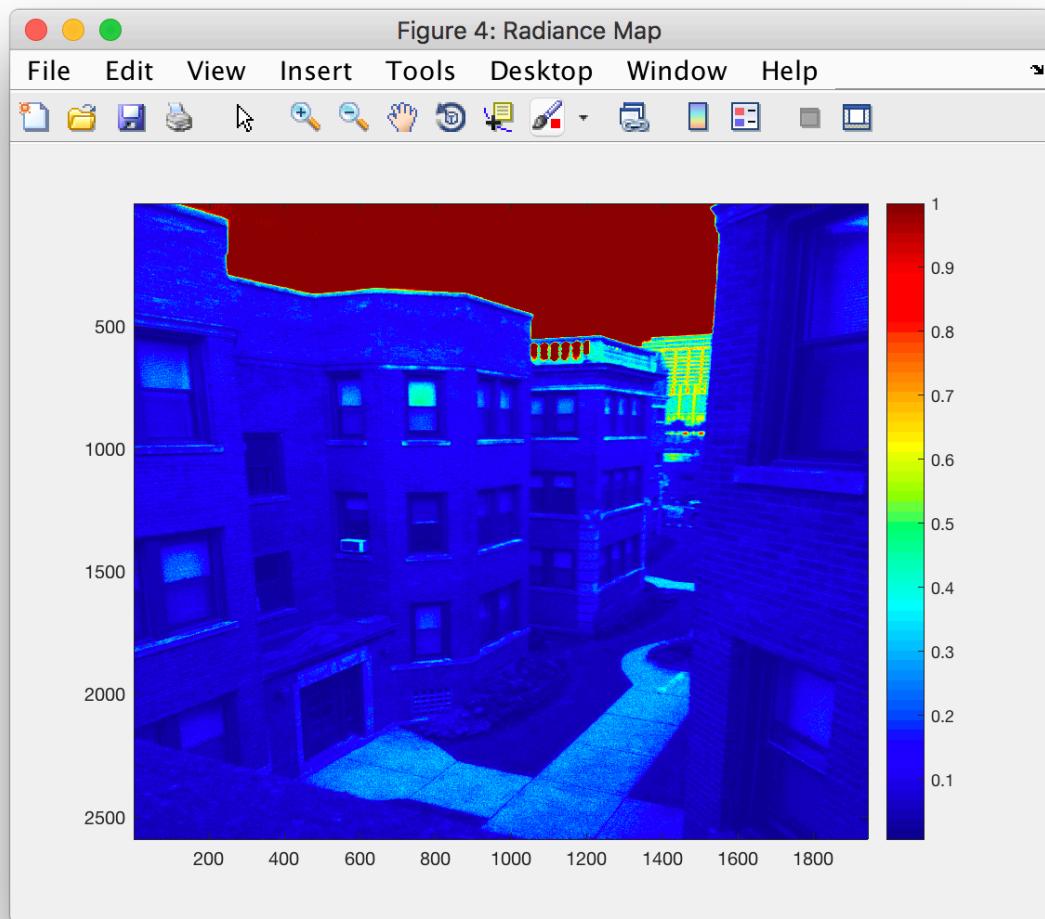
2. Write a program to find the camera response curves for the shield tablet

Regularization Parameter ' l ' = 5

For lower values of ' l ' it can be seen that there is higher deviation in the scatter plot.



3. Recover the HDR radiance map of the scene



4. What is the dynamic range of your scene?

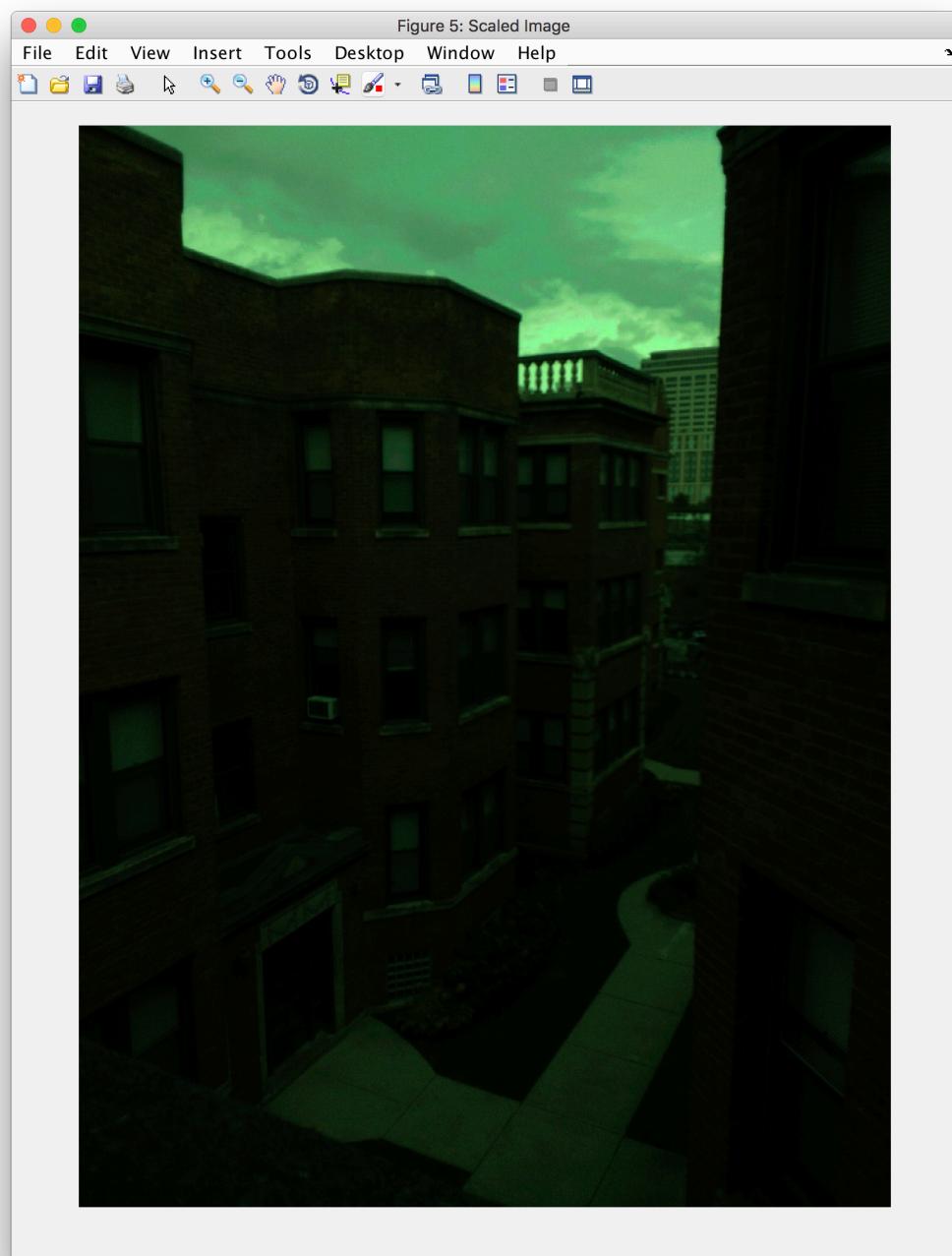
The Tegra camera could capture 13 images over its exposure range with 2X changes in the EV.

Therefore, no of stops/EV = 13

The Dynamic Range : $10^5:1$ or $10,000:1$

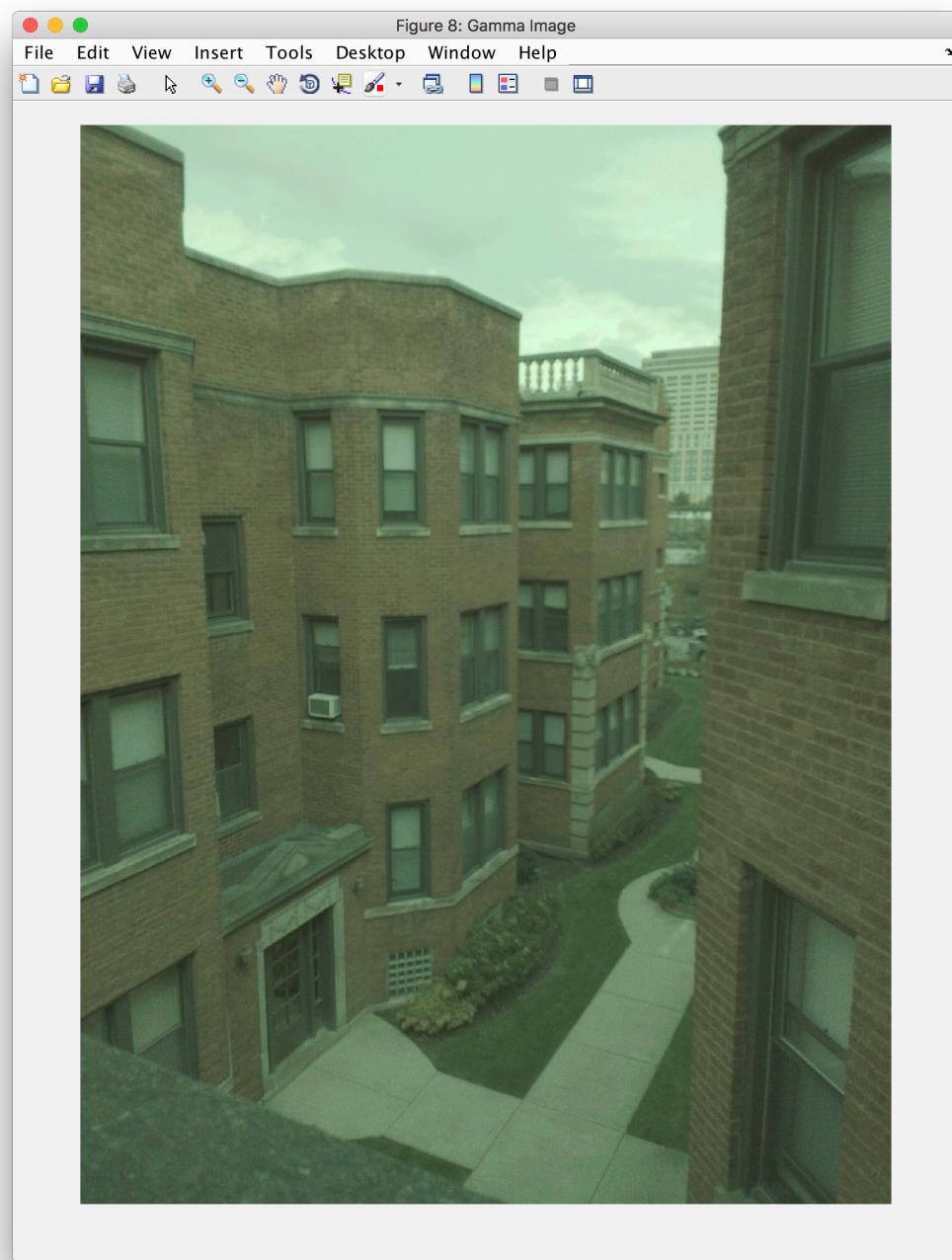
5. Implement a tone mapping algorithm to display your HDR image

5.1. Scaling the brightness of all pixels



5.2. Applying a gamma curve

Gamma value chosen ' γ ' = 0.3



5.3. Applying Global Tone Mapping from Reinhard '02.

'a' value chosen = 0.6

