

Spatial Transformations

María Susana Ávila García

19 Febrero 2019

Material de Referencia: Digital Image Processing (3rd Edition). Rafael C. Gonzalez, Richard E. Woods

Original Image



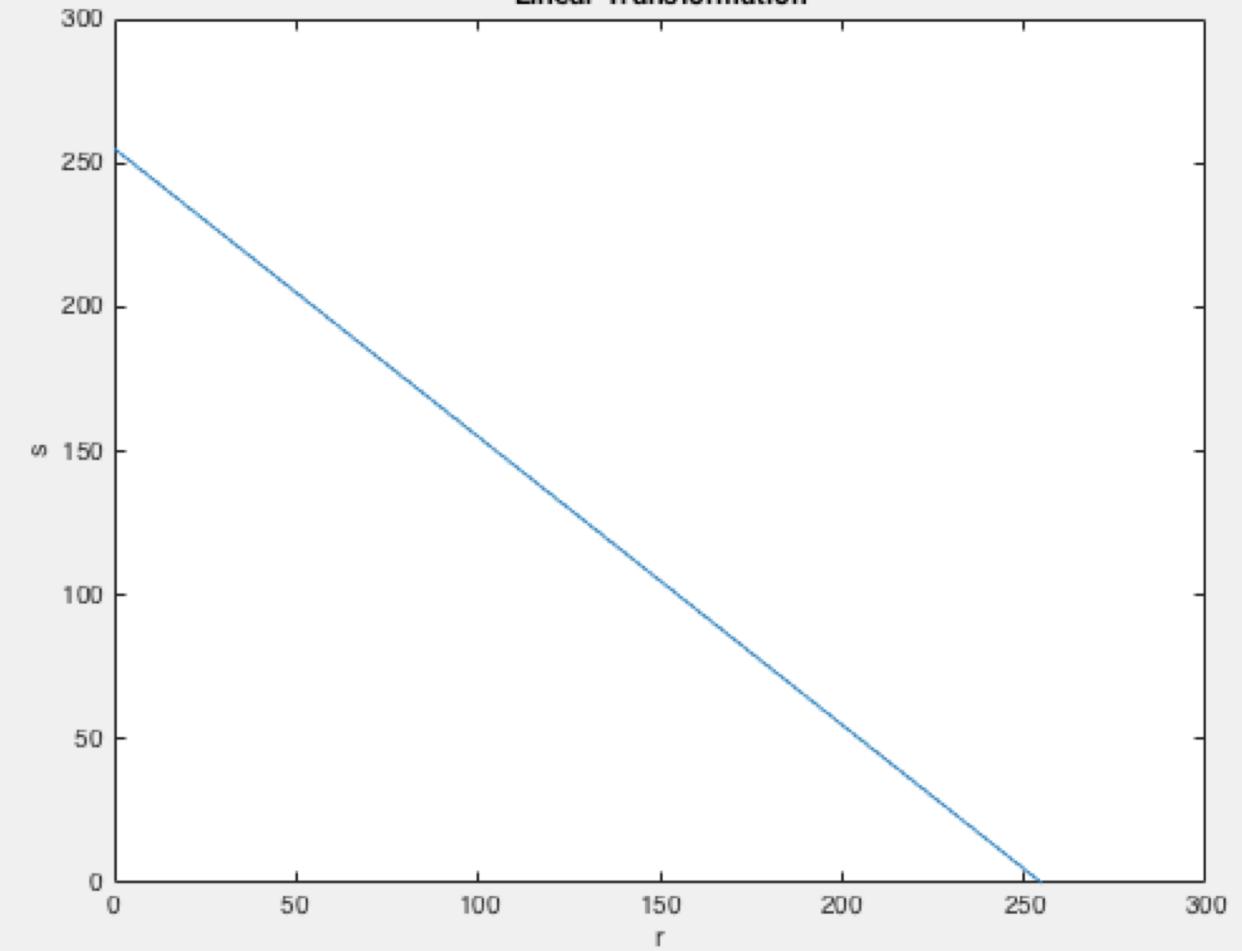


Linear Transformation

- $s \rightarrow$ Output intensity
- $r \rightarrow$ Input intensity
- $L \rightarrow$ Levels of Intensity

$$s = L - 1 - r$$

Linear Transformation



Black and White



Black and White Complement

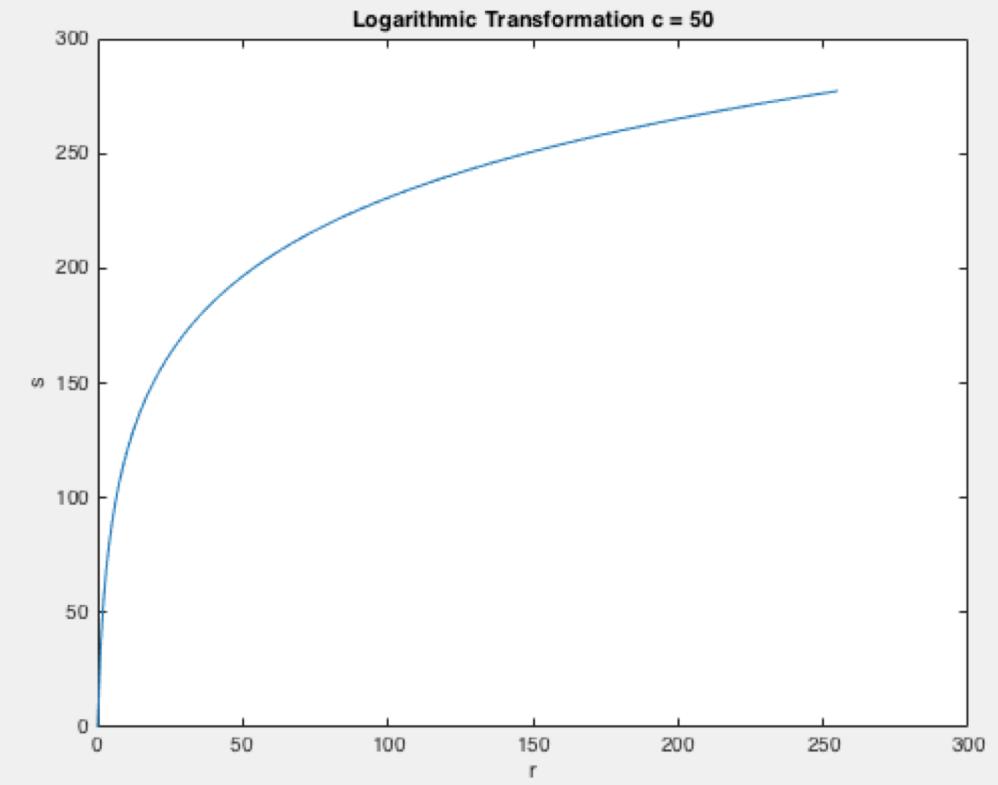
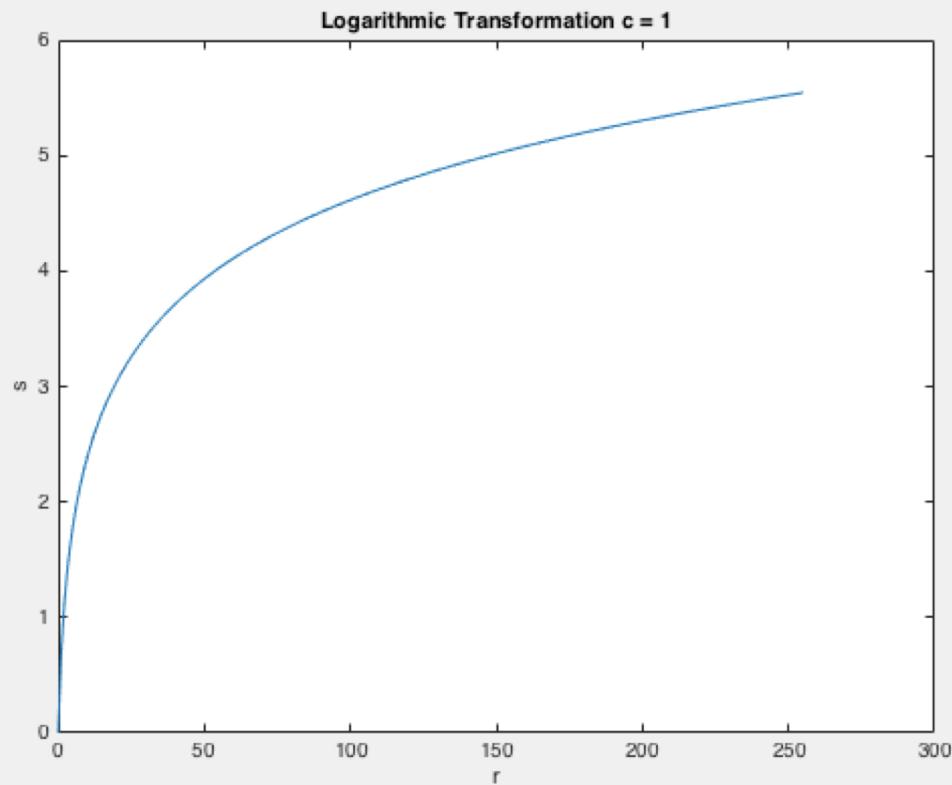




Grey Scale



Grey Scale Complement



Logarithmic Transformation

$$s = c \log(1+r)$$
$$r \geq 0; c \text{ is constant}$$



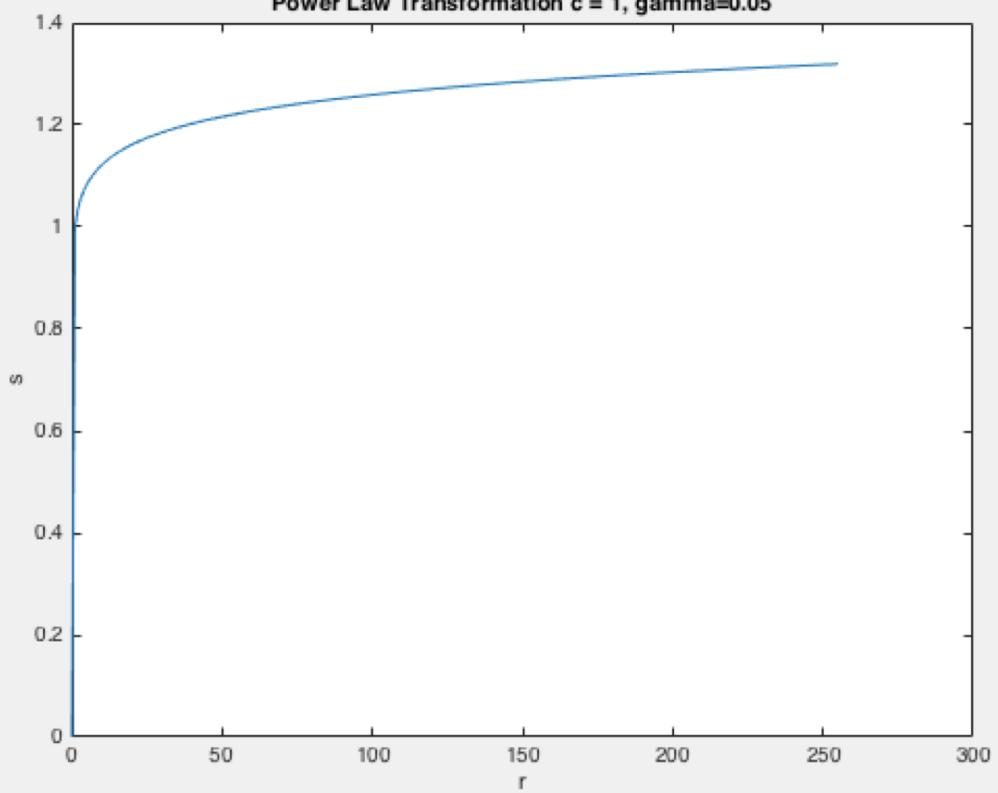
||



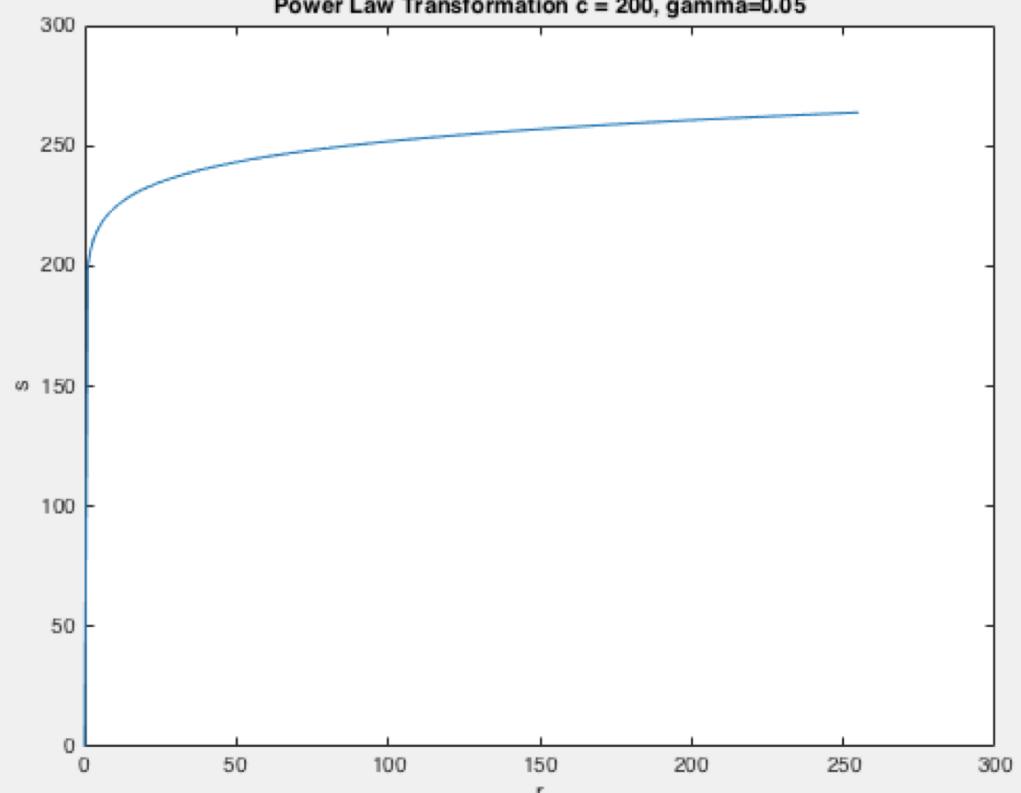
Logarithmic Transform

c=50

Power Law Transformation c = 1, gamma=0.05

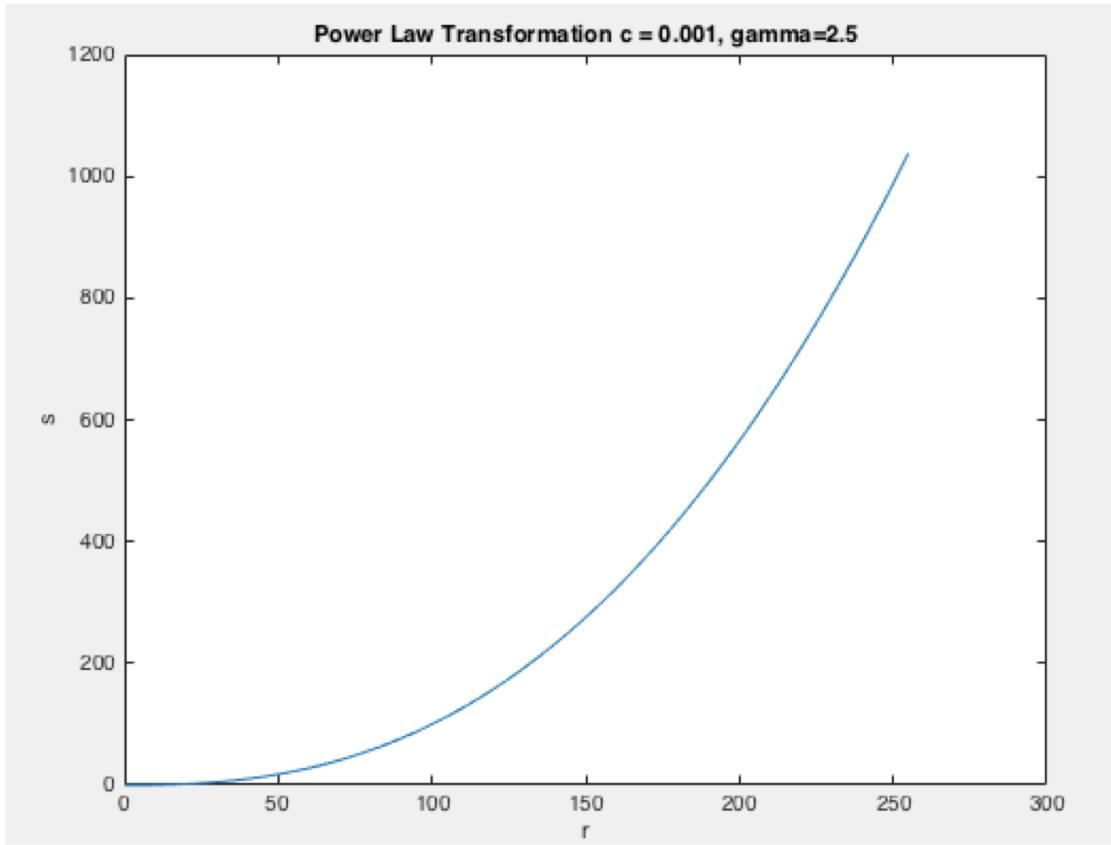


Power Law Transformation c = 200, gamma=0.05

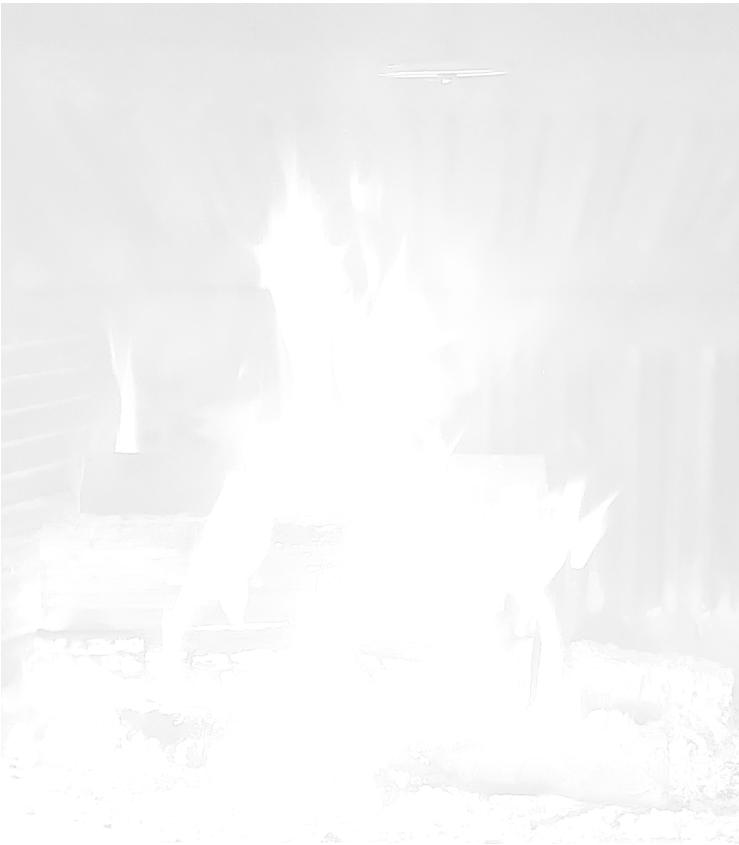


Power Law Transform

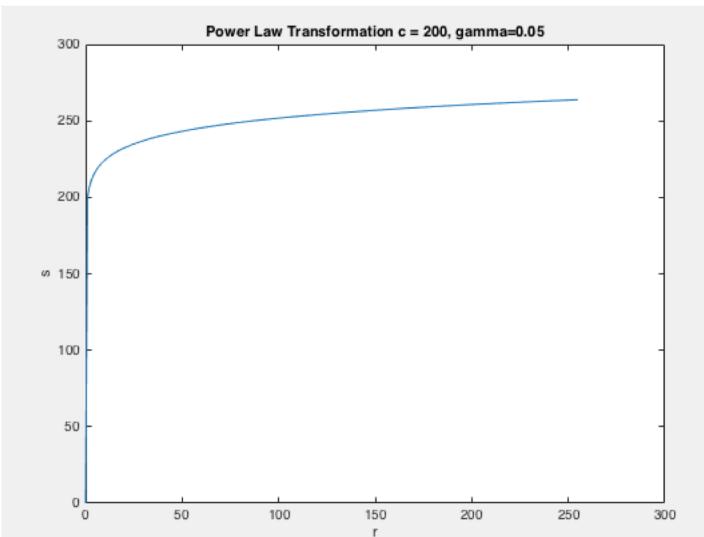
$$s = cr^{\gamma}$$



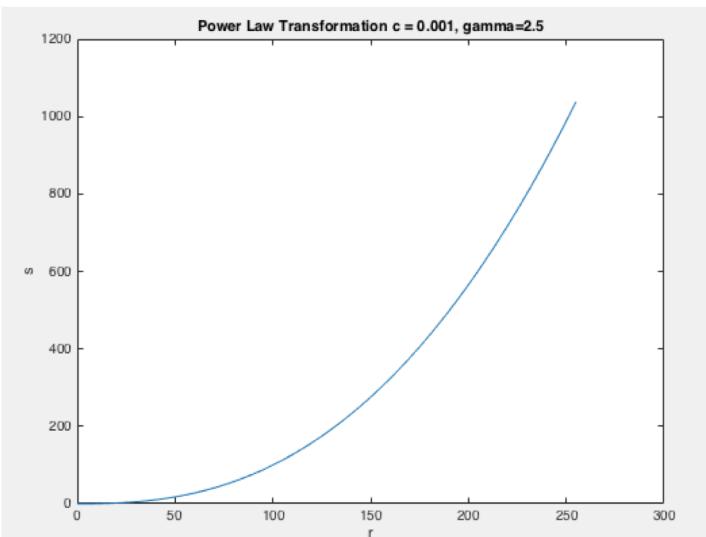
Power Law Transform
 $s = cr^{\gamma}$



Left Grey Scale Image, Mid ($c=200$, $\gamma=0.05$),
Right($c=0.001$, $\gamma=2.5$)



$(c=200, \gamma=0.05)$,



$c=0.001, \gamma= 2.5$