Image Statistics with supplied test image

Based on the test image supplied (testImage.bmp) and with the help of **Statistics and Machine Learning Toolbox** 10 image statistics were calculated in **MATLAB**. In order to achieve the following results, the image was converted to **greyscale** using **rgb2gray**. Please, see the achieved results below:

```
   205

    0.8039

    0.8367

   66.0763

  123.3943

   82.9792

  103.4029

  122.5000

  116.2541

  123.2447

fx >>
```

Fig1: Achieved Results

Statistic	Formula	Value(s)
Range	$C_{range} = L_{max} - L_{min}$	$= 205$
Normalised Range	$C_{normRange} = \frac{L_{max} - L_{min}}{2^t - 1}$	$= 0.8039$
Michelson Contrast	$C_{mich} = \frac{L_{max} - L_{min}}{L_{max} + L_{min}}$	$= 0.8367$
RMS Contrast	$C_{rms} = \sqrt{\frac{1}{MN}\sum_{i=1}^{M}\sum_{j=1}^{N}\left(L_{i,j} - \bar{L}\right)^2}$	$= 66.0763$
Simple Arithmetic Mean	$\bar{L} = \frac{1}{MN}\sum_{i=1}^{M}\sum_{j=1}^{N} L_{i,j}$	$= 123.3943$
Harmonic Mean	$\bar{L}_{harm} = (MN) \Big/ \sum_{i=1}^{M}\sum_{j=1}^{N}\frac{1}{L_{i,j}}$	$= 82.9792$
Geometric Mean	$\bar{L}_{geom} = \left(\prod_{i=1}^{M}\prod_{j=1}^{N} L_{i,j}\right)^{\frac{1}{MN}} = \exp\left(\frac{1}{MN}\sum_{i=1}^{M}\sum_{j=1}^{N}\ln(L_{i,j})\right)$	$= 103.4029$
Midrange	`Cmidrange = Lmax+Lmin/2`	$= 122.50$
10% Winsorised Mean	$\bar{L}_{wk} = \frac{1}{n}\{(k+1)L_{(k+1)} + \sum_{i=k+2}^{n-k-1} L_i + (k+1)L_{(n-k)}\}$	$= 116.2541$
10% Trimmed Mean	$\bar{L}_{tk} = (1/\mathrm{n} - 2\mathrm{k})\sum_{i=k+1}^{n-k} L_i$	$= 123.2447$