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Remote Sensing

 Chap 6 HW

1. This image of San Diego Harbor (Fig 6.16) was taken on February 7, 2000 by the IKONOS satellite. What can you tell about the two ships? The carrier is 315-m long. What can you tell about the other ship?
	1. From the image it seems as if one ship is a carrier ship and the other is not as wide, and might be able to move faster. Furthermore, from the image it seems as if this might be a harbor, an NOB. Therefore you should be able to tell information of the harbor, the type of ships, piers, facilities, how many planes are on bored.
2. How can you tell that a road or rail line was intended for missile transport?
	1. You can tell because the road connects to a rail line, that leads to a warehouse.
3. For an otherwise uniform scene (Fig. 6.17), there is a target with higher DN. The variance is 5106.4. Calculate the standard deviation ($σ$). Estimate distance between the target and background, in units of ($σ$).
	1. $σ=\sqrt{Variance}=\sqrt{5106.4}=71.46$
4. In fig. 6.18, three regions are identified: water, a bright soil, and the old Moss Landing refinery site (red), with some very bright white sand and soil. Describe what dynamic ranges you would use to display the scene so as to enhance each region of interest. As an example, the best display for the soil would be to scale the data so that DN = 250 – 450 mapped to a digital range of 0 – 255.

For digital range of 0 to 255, 0 to 100 would be water, 100 to 150 would be soil, and 150 to 225 would be land.

1. For a scene with 4 pixels, calculate the correlation between the pixels, and the covariance.

|  |  |  |  |
| --- | --- | --- | --- |
| Pixel # | Red(DN) | Green(DN) | Blue(DN) |
| 1 | 40 | 50 | 60 |
| 2 | 20 | 25 | 28 |
| 3 | 30 | 30 | 30 |
| 4 | 15 | 16 | 14 |

Red\_DN=[40, 20, 30, 15];

Green\_DN=[50, 25, 30, 16];

Blue\_DN=[60, 28, 30, 14];

RedGreenConv=conv(Red\_DN,Green\_DN);

RedBlueGreenConv=conv(RedGreenConv,Blue\_DN)

RedGreenCoef=corrcoef(Red\_DN,Green\_DN);

RedBlueGreenCoef=corrcoef(RedGreenCoef,Blue\_DN)

RedBlueGreenConv =

 Columns 1 through 5

 120000 176000 308000 342000 296420

 Columns 6 through 10

 227460 126650 56950 20220 3360

RedBlueGreenCoef =

 1.0000 0.2386

 0.2386 1.0000