

	45	46	47	48
49				
50		194	152	
51		147	160	
52				

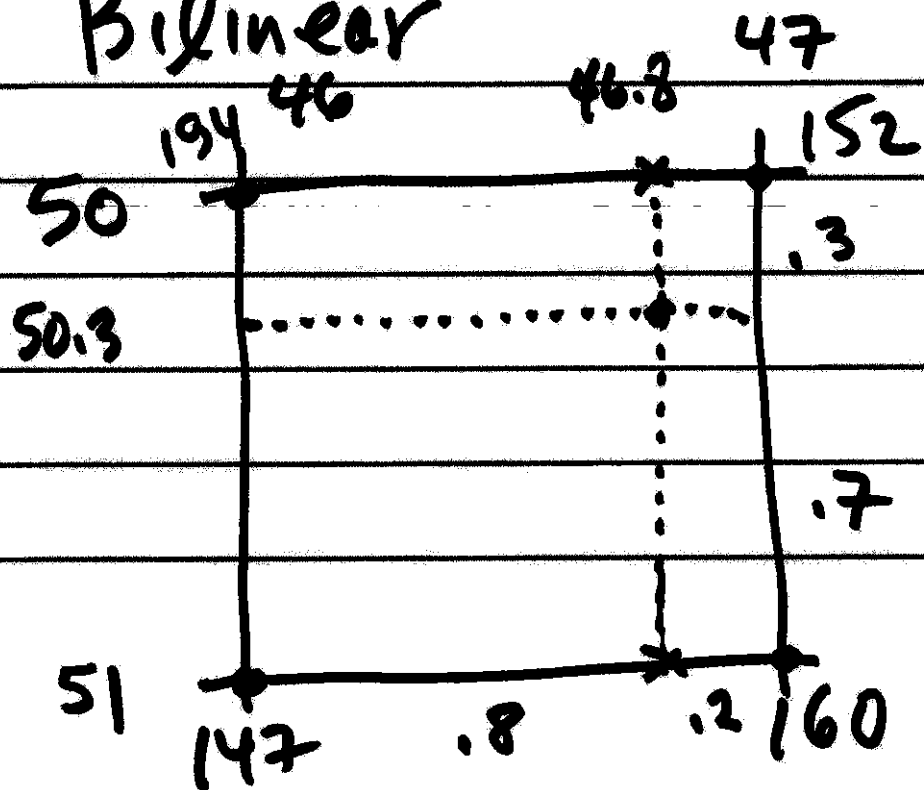
interpolate gray value¹⁵⁻¹

@ r: 50.3, c: 46.8

NN: 50, 47

$$I_{NN}(50.3, 46.8) = 152$$

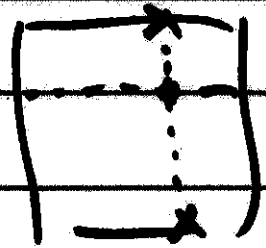
Bilinear



$$g_{050} = 0.8 \times 152 + 0.2 \times 194 = 160.4$$

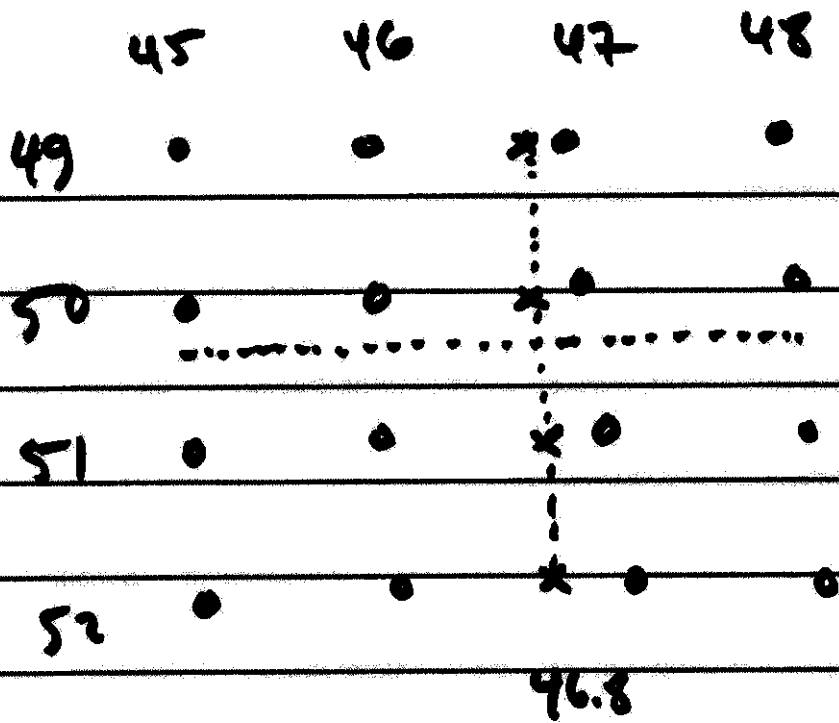
$$g_{051} = 0.8 \times 160 + 0.2 \times 147 = 157.4$$

$$g = 0.3 \times 157.4 + 0.7 \times 160.4$$



$$g = 159.5$$

Bilinear Interpolation



$$\begin{aligned} r_{49} &= f_r \\ r_{50} &= f_r \\ r_{51} &= f_r \\ r_{52} &= f_r \end{aligned}$$

$$f_r = \begin{bmatrix} f(45 - 46.8) \\ f(46 - 46.8) \\ f(47 - 46.8) \\ f(48 - 46.8) \end{bmatrix}$$

$$f_c \cdot \begin{bmatrix} r_{49} \cdot f_r \\ r_{50} \cdot f_r \\ r_{51} \cdot f_r \\ r_{52} \cdot f_r \end{bmatrix} \quad f_c: \begin{bmatrix} f(49 - 50.3) \\ f(50 - 50.3) \\ f(51 - 50.3) \\ f(52 - 50.3) \end{bmatrix}$$

$$I_{cc} = [f_{c1} \ f_{c2} \ f_{c3} \ f_{c4}] \begin{bmatrix} - & - & - & - \\ - & - & - & - \\ - & - & - & - \\ - & - & - & - \end{bmatrix} \begin{bmatrix} f_{r1} \\ f_{r2} \\ f_{r3} \\ f_{r4} \end{bmatrix}$$

$$I_{cc} = 157.2$$

Rectified Image Production Flow Chart¹⁵⁻⁵

1. Specify model: projecting XYZ object \rightarrow XY image
Ground to Image

Collinearity

8-parameter

mapping polynomials

replacement RPC, RFM

} $G \rightarrow I$

2. Specify extent + location + orientation

3. Specify sampling interval

GSD: ground sample distance

dx, dy $dx = dy$

4. make an empty image file with
rows + columns

