Tratamiento de Imágenes Médicas Incorporación de Conocimiento Previo

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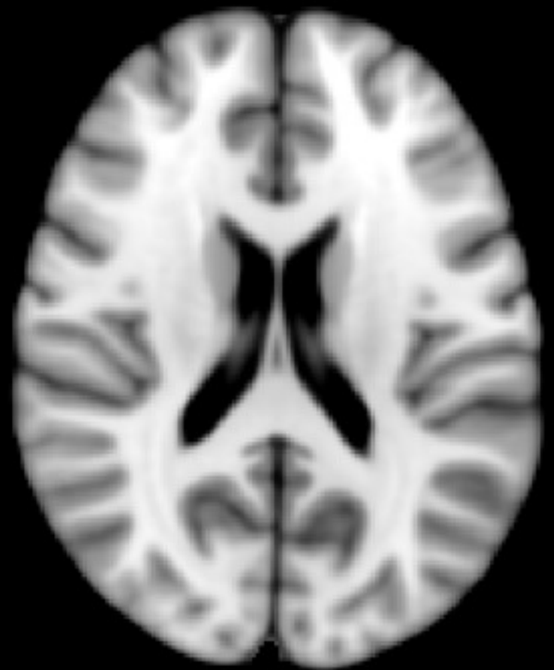
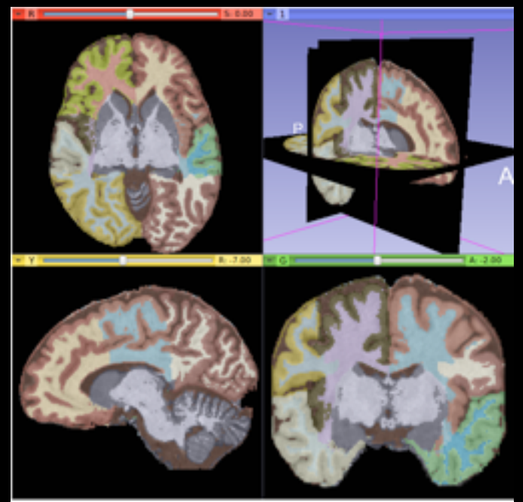
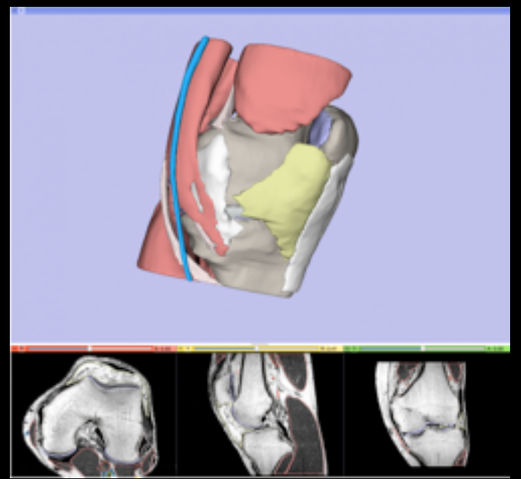
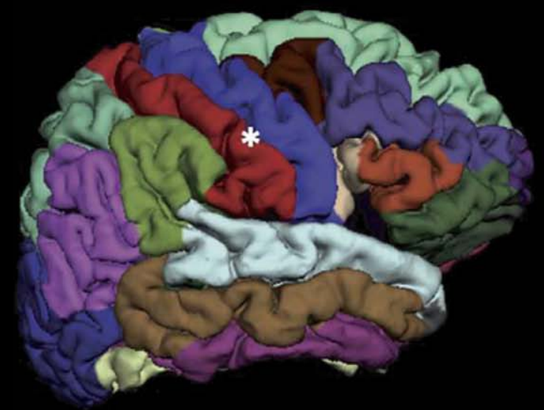
Segmentación De Imágenes









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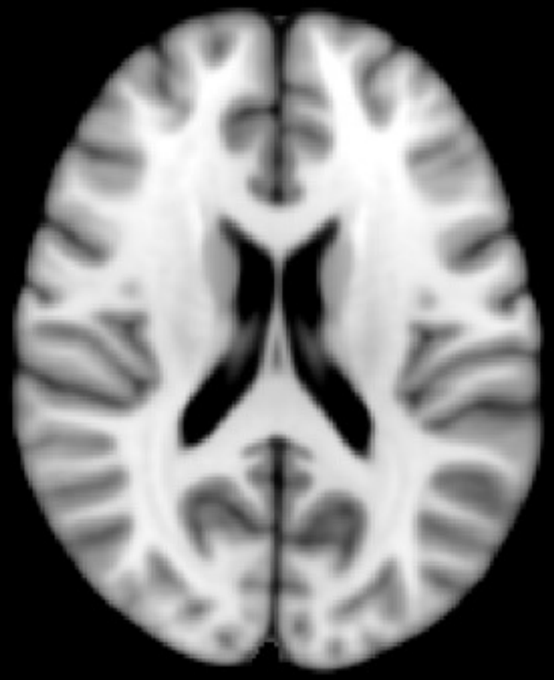
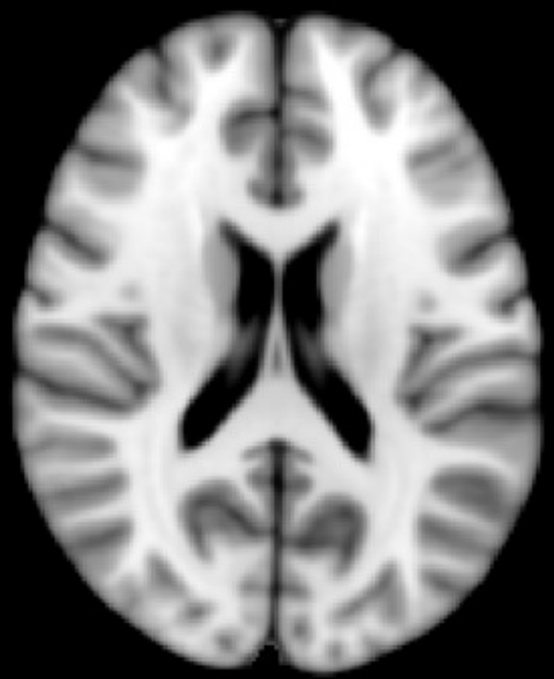
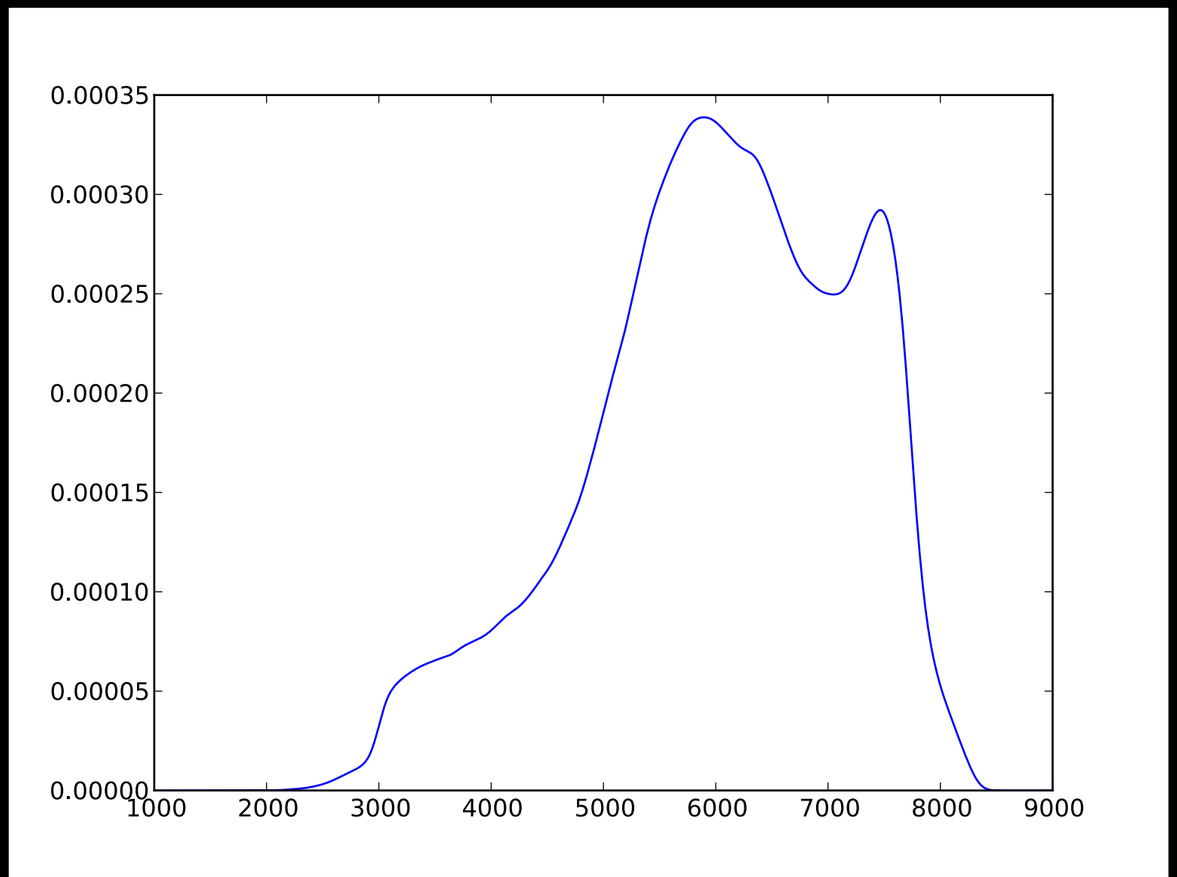


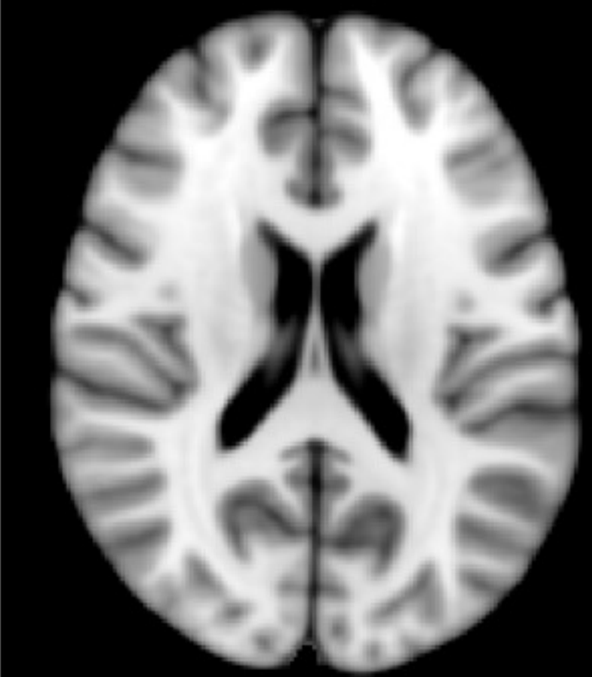
- Umbralado manual
- Umbralado automático
- Separación de modos en distribuciones de probabilidad multimodales
- Incorporación de conocimiento a-priori

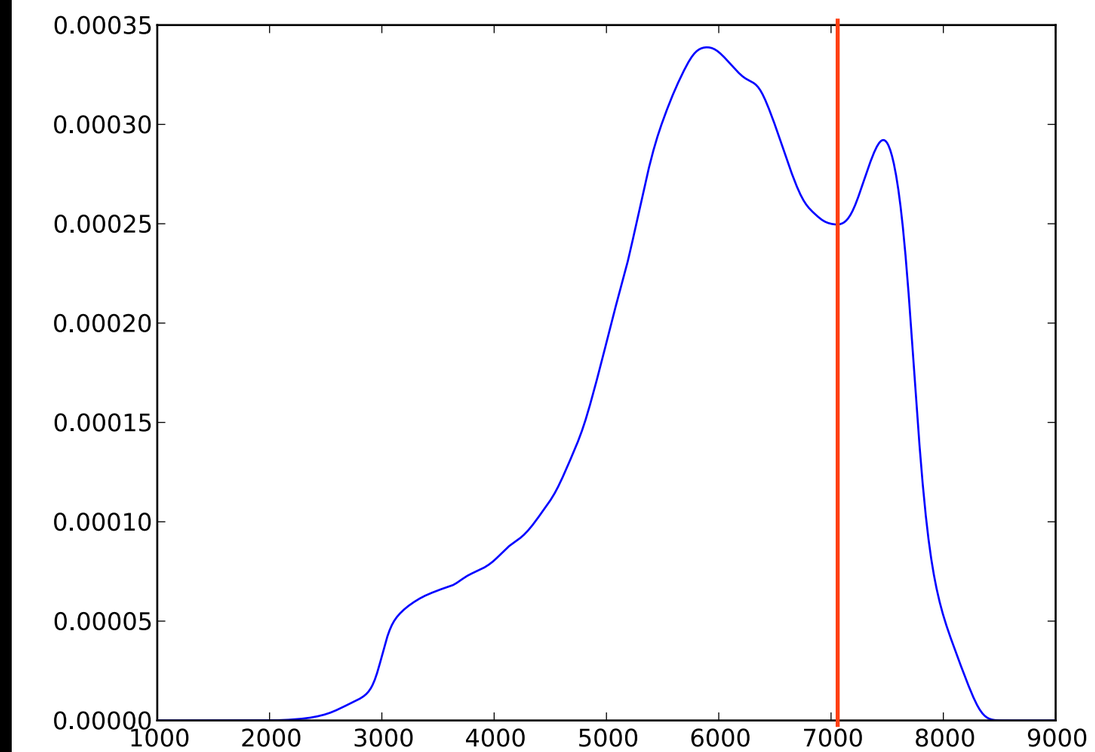
Segmentación De Imágenes





Umbralado Simple

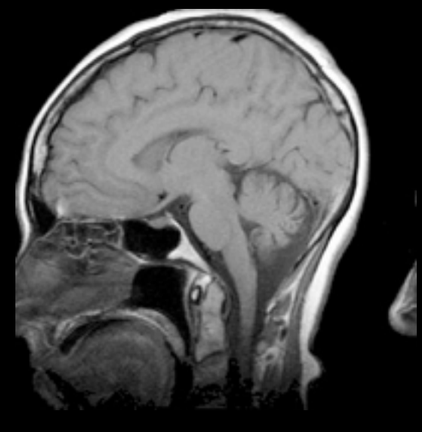




Problemas: Artefactos

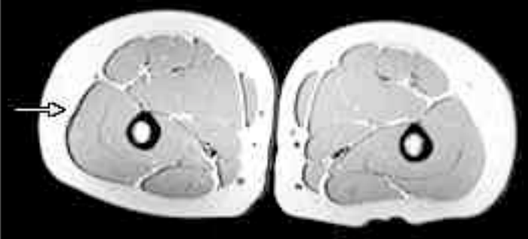
Problemas de
Corriente Continua

Homogeneidad del Campo
Magnético de Base



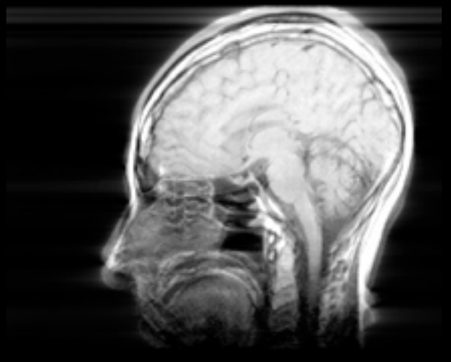
Campo de Vista
(Wraparound)

Movimiento
(flujo sanguíneo)



Desplazamiento Químico

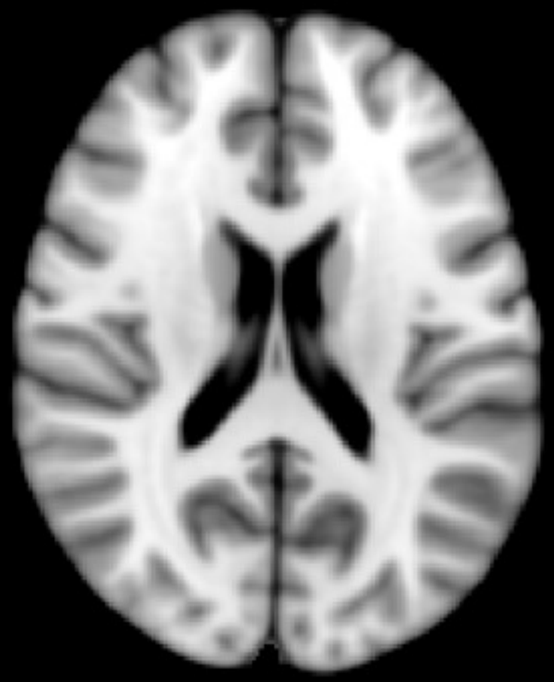
Homogeneidad de
Radiofreceuencias



Movimiento

Umbralado Automático

$$p_i = \frac{\#\{\forall x : I(x) = i\}}{N}$$

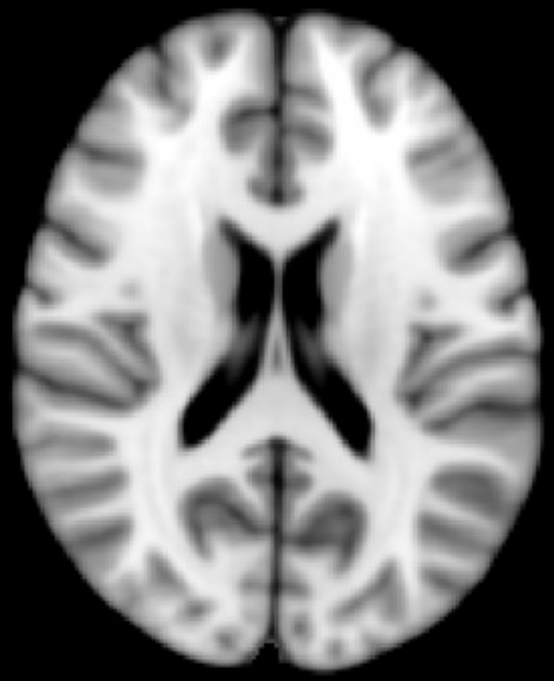


$$\omega_0 = Pr(C_0) = \sum_{i=0}^{k} p_i$$

$$\omega_1 = Pr(C_1) = \sum_{i=k+1}^{N} p_i$$

Umbralado Automático

$$p_i = \frac{\#\{\forall x : I(x) = i\}}{N}$$

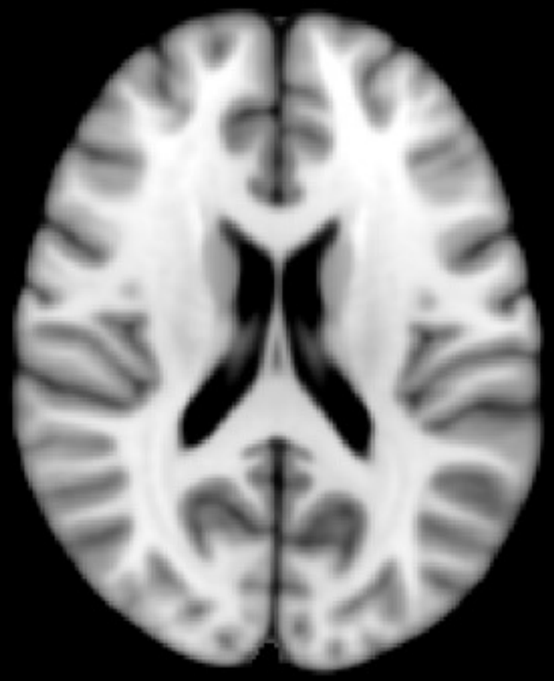


$$\omega_0 = Pr(C_0) = \sum_{i=0}^{k} p_i$$

$$\mu_0 = \sum_{i=0}^{k} i p_i$$

$$\sigma_0^2 = \sum_{i=0}^{k} (i - \mu_0)^2 Pr(i|C_0) = \sum_{i=0}^{k} (i - \mu_0)^2 p_i / \omega_0$$

Umbralado Automático



$$\sigma_T^2 = \sum (i - \mu_T)^2 p_i$$

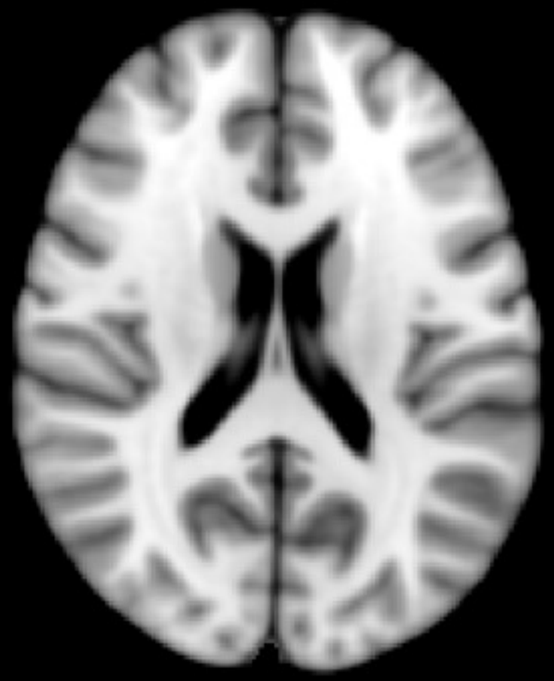
$$\sigma_W^2 = \omega_0 \sigma_0^2 + \omega_1 \sigma_1^2$$

$$\sigma_B^2 = \omega_0(\mu_0 - \mu_T)^2 + \omega_1(\mu_1 - \mu_T)^2 = \omega_0\omega_1(\mu_1 - \mu_0)^2$$

$$\lambda = \sigma_B^2/\sigma_W^2 \qquad \kappa = \sigma_T^2/\sigma_W^2 \qquad \eta = \sigma_B^2/\sigma_T^2$$

$$\sigma_W^2 + \sigma_B^2 = \sigma_T^2$$

Umbralado Automático



$$\sigma_T^2 = \sum (i - \mu_T)^2 p_i$$

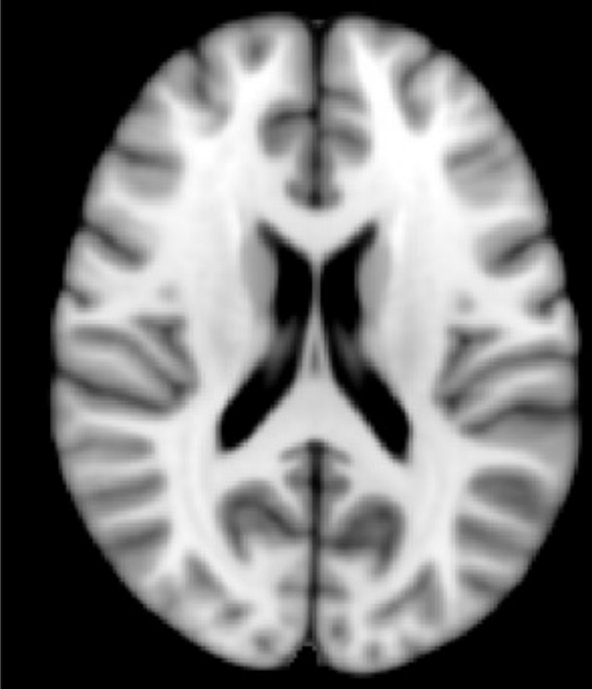
$$\sigma_W^2 = \omega_0 \sigma_0^2 + \omega_1 \sigma_1^2$$

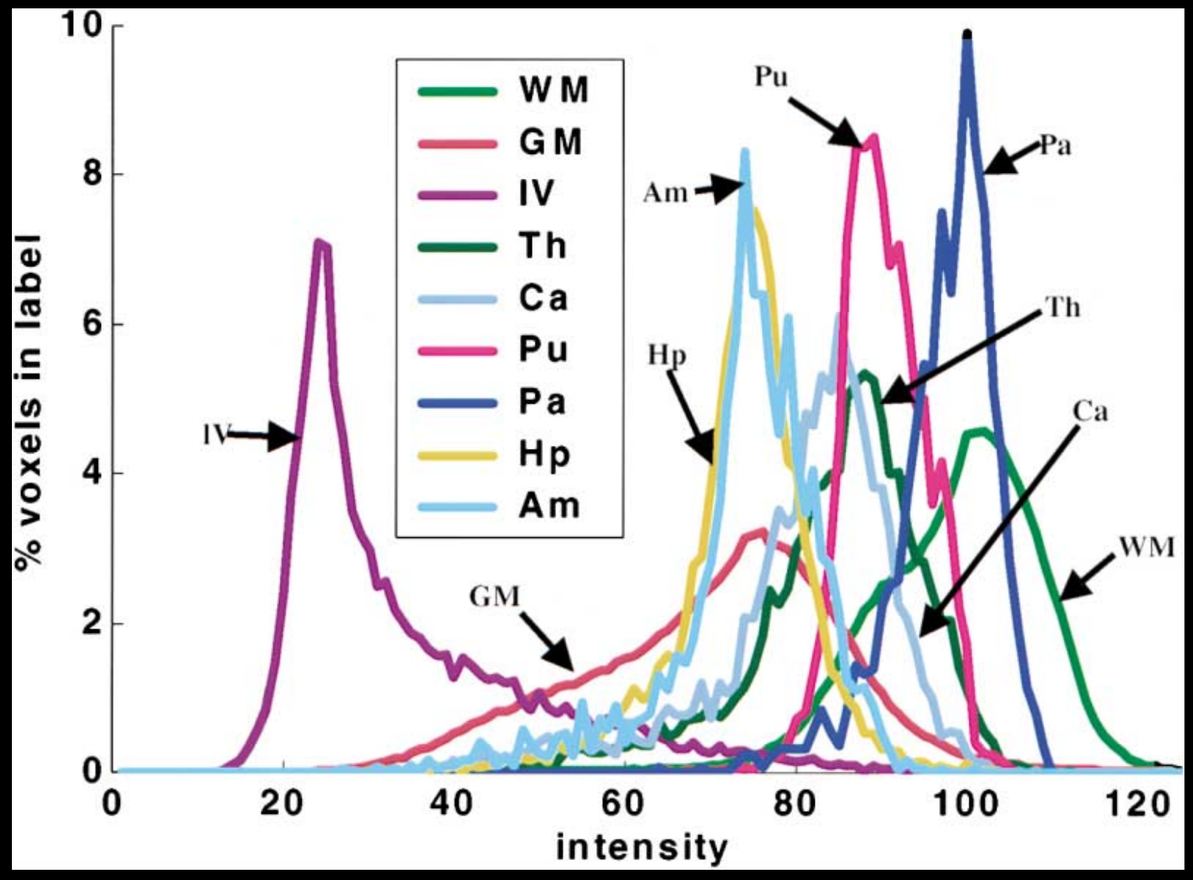
$$\sigma_B^2 = \omega_0(\mu_0 - \mu_T)^2 + \omega_1(\mu_1 - \mu_T)^2 = \omega_0\omega_1(\mu_1 - \mu_0)^2$$

$$\lambda = \sigma_B^2/\sigma_W^2 \qquad \kappa = \sigma_T^2/\sigma_W^2 \qquad \eta = \sigma_B^2/\sigma_T^2$$

$$\sigma_W^2 + \sigma_B^2 = \sigma_T^2$$

Problemas: Tejidos





[Fischl et al 2002]