

SUNRISE EDUCATIONAL COURSE
Absolute Beginners' Guide to Anatomical & Functional MRI of the Brain
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Registration, Segmentation and Atlases

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Overview:

Registration (the alignment of images), segmentation (the identification of structures within an image) and atlases (a spatio-temporal representation of anatomy and function) are often used in the analysis of medical images.

This talk will describe the basic components of image registration that can be used to align different medical image datasets together. These include the similarity function, the spatial mapping transformation and the optimization method used to find the optimal image registration.

Two main classes of methods to label of structures within an image will be described. The first uses only the image intensity information while the second adds spatial information to achieve image labeling.

Finally, atlases are used to describe normal and abnormal anatomy. Methods for atlas creation and use will be presented.

Education objectives:

- Identify the three major components of image registration
- Describe the advantages and limitations of different image registration methods
- Identify the two major classes of technique for image segmentation
- Be able to identify which technique can be used for a given application
- Describe the advantages and limitations of atlases used for image interpretation.