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Statistical Models of Shape

Optimisation and Evaluation

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Computer Science : Image Processing and Computer Vision

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Statistical Models of Shape

Optimisation and Evaluation

- Addresses one of the key issues in shape modelling: that of establishing a meaningful correspondence between a set of shapes
- Uses a novel approach to establishing correspondence by casting model-building as an optimisation problem
- Includes practical examples of applications for both 2D and 3D sets of shapes
- Full implementation details, perviously unpublished, provided

The goal of image interpretation is to convert raw image data into me- ingful information. Images are often interpreted manually. In medicine, for example, a radiologist looks at a medical image, interprets it, and tra- lates the data into a clinically useful form. Manual image interpretation is, however, a time-consuming, error-prone, and subjective process that often requires specialist knowledge. Automated methods that promise fast and - jective image interpretation have therefore stirred up much interest and have become a signi?cant area of research activity. Early work on automated interpretation used low-level operations such as edge detection and region growing to label objects in images. These can p-ducereasonableresultsonsimpleimages,butthepresenceofnoise,occlusion, andstructuralcomplexity oftenleadstoerroneouslabelling. Furthermore,- belling an object is often only the ?rst step of the interpretation process. In order to perform higher-level analysis, a priori information must be incor- rated into the interpretation process. A convenient way of achieving this is to use a ? exible model to encode information such as the expected size, shape, appearance, and position of objects in an image. The use of ?exible models was popularized by the active contour model, or 'snake' [98]. A snake deforms so as to match image evidence (e.g., edges) whilst ensuring that it satis?es structural constraints. However, a snake lacks speci?city as it has little knowledge of the domain, limiting its value in image interpretation.