Reconstruction of 3D Patient - Specific Bone Models From Biplannnar X- Ray Images Utilizing Morphometric Measurements .

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Abstract - Obtaining 3D patient-specific bone models from 2D image data (e.g. x - rays flouroscope) remains a practical and desirable alternative to segmentation of bone models from 3D image data 9 e.g. Ct , MRI) . It also provides an initial step to automatically calculating the relevant and axes and angles needed in Computer Aided Surgery (CAS). Our method utilizes a statistical atlas of bone based on Principal Component Analysis (PCA) and biplanar X - ray images to fully reconstruct a patient - specific 3D bone model . Reconstruction is done through a robust 3D-2D registration technique where the deformation is constrained through extracted 2D morphometric measurements. Reconstruction of both femur and lumbar where undertaken with results compared to manual segmentations .