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AUTOMATED PROCESSING OF MICRO-CT SCANS AND MICRO-FE RESULTS FOR COMPUTER SIMULATIONS OF MECHANICAL PROPERTIES OF BONE TISSUE

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Summary: Processing of micro-CT scans was successfully applied to determine mechanical properties of cancellous bone tissue using linear micro-FE simulations. Descriptor-based approach was used for registration of 70 dissected cuboid specimens of cancellous bone in 6 bovine femur heads, using local geometric descriptors based on 3D Laplace filter and nearest neighbours identification. The developed methodology allows for verification of mechanical properties of bone tissue, enabling precise determination of local anisotropy and therefore the study of behaviour of the bone under load. It can be valuable tool for ex vivo and in vivo studies in the near future for the purpose of measurements from CBCT and HR-pQCT.