Mesh segmentation and texture mapping for dimensional inspection in Web3D

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Traditionally, the data generated by industrial metrology software is stored as static reports that metrology experts produce for engineering and production departments. Nevertheless, industry demands new approaches that provide ubiquitous and real time access to overall geometry, manufacturing and other data. Web3D technologies can help to improve the traditional metrology methods and offer new ways to convey this information in web-based continuous friendly manner. However, enriched point clouds may be massive, thus presenting transmission and display limitations. To partially overcome these limitations, this article presents an algorithm that computes efficient metrology textures, which are then transferred and displayed through Web3D standards. Texture coordinates are computed only once for the reference CAD mesh on the server using in-house thermal-based segmentation and Hessian-based parameterization algorithms. The metrology data is then encoded in a texture file, which becomes available instantly for interactive visual inspection through the Web3D platform.