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Visual Analysis of Damage Mechanisms in Glass Fiber Reinforced Polymers

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Interrupted in situ tensile tests are used in industry to study the evolution and accumulation of damages under load in glass fiber reinforced polymers (GFRPs).

During these tests, a test specimen is scanned multiple times using a computed tomography (CT) device under increasing load.

The obtained series of CT scans is analyzed by material engineers regarding defects to draw conclusions about the material.

In particular, material engineers are interested in visualization of individual defects, visualization of series of CT scans, and visualization of quantitative information of defects.

To address these requirements, we have extended and improved a tool, which material engineers are currently using to perform analysis of such tests.

We have extended the Defect Viewer tool to render defects in 3D.

We have implemented a juxtaposition visualization to track changes between steps in a series of CT scans.

Finally, we have implemented a heatmap visualization to calculate and render quantitative information of defects in 2D.

Primary author: Mr AMIRKHANOV, Alexander (University of Applied Sciences Upper Austria, Wels Campus)

Co-authors: Dr HEINZL, Christoph (University of Applied Sciences Upper Austria, Wels Campus); Prof. GRÖLLER, Eduard (Institute of Computer Graphics and Algorithms, Vienna University of Technology, Austria); Prof. KASTNER, Johann (University of Applied Sciences Upper Austria, Wels Campus)

Presenter: Mr AMIRKHANOV, Alexander (University of Applied Sciences Upper Austria, Wels Campus)

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