
GlasDigital: Data-driven workflow for accelerated glass development

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Abstract

Glasses stand out by their wide and continuously tunable chemical composition and large variety of unique shaping techniques making them a key component of modern high technologies. Glass development, however, is still often too cost-, time- and energy-intensive. The use of robotic melting systems embedded in an ontology-based digital environment is intended to overcome these problems in future. As part of the German research initiative *MaterialDigital* (1), the joint project *GlasDigital* takes first steps in this direction. The project consortium involves the Fraunhofer ISC in Würzburg, the Friedrich Schiller University Jena (OSIM), the Clausthal University of Technology (INW), and the Federal Institute for Materials Research and Testing (BAM, Division Glasses) and aims to combine all main basic components required for accelerated data driven glass development. For this purpose, a robotic high throughput glass melting system is equipped with novel inline sensors for process monitoring, machine learning (ML)-based, adaptive algorithms for process monitoring and optimization, novel tools for high throughput glass analysis and ML-based algorithms for glass design, including software tools for data mining as well as property and process modelling. The talk gives an overview how all these tools are interconnected and illustrates their usability with some examples. (1) <https://www.materialdigital.de/>

Keywords: data driven glass development, robotic melting, digital environment

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