Identify Material Degradation by Deep Learning Approach

STAT 6650

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The degradation of polymer is an issue for reliability engineering. The material degradation could be characterized by mechanical properties and microstructure evolution. However, though the microstructure evolution and mechanical properties are related, their relationship is hard to quantify by physical approach. Thus, we are trying to reveal the connection between mechanical properties and microstructure evolution in a deep learning model. In this study, the deep learning method is applied to investigate the crack length and boundary layer propagation. The microstructure evolution as the function of aging time and temperatures are showing below.