

The problem of change detection using deep learning approaches is an active area of study in the field of computer vision, demonstrating results that outperform traditional approaches. This thesis aims to solve the problem of bi-temporal change detection of high-resolution videos with a focus on defects in the form of cracks, where the videos are recorded concrete cylinders and the changes are caused by radiation. The work proposes a pipeline for solving this problem from video acquisition and processing to final predictions, while analyzing and comparing different approaches and architectures based on semi-supervised and supervised learning. The thesis considers both well-proven CNNs and the latest approaches in the form of current SOTA leveraging Vision Transformer. In addition to analyzing existing solutions, we also propose our own architectures and optimization techniques using evolutionary algorithms. Part of the work also includes the creation of three datasets and their publication.