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Sensors applied in the detection of physical changes at heritage buildings

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Heritage buildings are susceptible to environmental impacts, and many of the stone structures show intense damage due to weathering, soil instability or improper use. The detection of changes has primary importance in the understanding of deterioration processes, and it provides essential information for the preservation of these structures. The application of destructive techniques to assess the condition of the materials of these heritage structures are not feasible and in most cases, not permitted. Consequently, monitoring of the health of the construction material and the structure require techniques that are not destructive and automatically collects data from the sites. The study provides an overview of sensors that could be applied in monitoring of the conditions of cultural heritage structures. From the methods of placing sensors at sites to available data collection system – the entire process will be overviewed. Applications of spectroscopic sensors for in situ and real-time analysis of critical colorimetric parameters of building materials will be presented. Application of artificial intelligence-based data processing in the prediction of material degradation is also discussed. Optical detectors of remote sensing techniques applied in monitoring of heritage buildings are also addressed. The financial support of National Research, Development and Innovation (NKFI) Fund (K 116532) is appreciated.