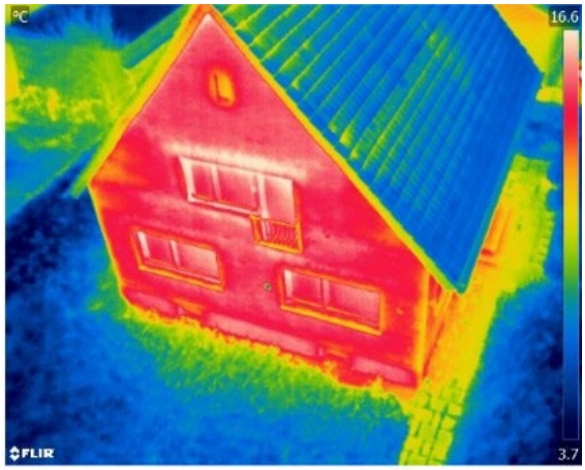
Lehrstuhl für Multimediakommunikation und Signalverarbeitung
Universität Erlangen-Nürnberg

Proposal for a Master's thesis

Learning-based video compression for thermography data

Thermographic data recorded by thermal imaging cameras offers a valuable opportunity to monitor and analyze the thermal properties of people, objects and buildings. Compared to conventional video data, thermographic data differs in its special representation of heat distributions, which not only contain a different type of image information, but also have different compression requirements. The efficient storage and transmission of this data is crucial for numerous applications, from industrial testing processes to medical diagnostics.



The master's thesis is dedicated to the development and adaptation of learning-based compression methods specifically for thermographic data. As conventional video compression algorithms are often not optimally suited to the special characteristics of thermographic data, there is a need for customized approaches. A central concern of the work is to use methods from the field of machine learning to optimize the compression of thermographic videos. An additional problem is the limited availability of sufficient training data for thermographic videos. In order to counteract this shortage, the work follows an approach in which normal video data is transformed by targeted augmentation in such a way that it simulates the characteristic features of thermography data. These augmentation techniques should make it possible to train effective compression models that take into account the specific requirements and data structures of thermographic data. The work includes both the theoretical development and the practical implementation of compression algorithms based on learning-based methods. Modern technologies and machine learning algorithms are used to improve compression efficiency and quality. The evaluation of the developed methods is carried out through comprehensive tests in order to assess the performance in comparison to existing compression methods.

Contact:	PD Dr.-Ing. habil. Jürgen Seiler, 06.034, juergen.seiler@fau.de
Professor:	Prof. Dr.-Ing. André Kaup
Prerequisites:	Experience with python programming, image and video signal processing, and machine learning
Available:	Immediately