IMAGE COMPRESSION IN EARTH OBSERVATIONS – AN APPLICATION ORIENTED INSIGHT FROM THE LOSSY PERSPECTIVE

B. BRKLJAČ

Faculty of Technical Sciences, Novi Sad, Serbia
E-mail: brkljacb@uns.ac.rs

Abstract: In this talk we will give a brief overview of the still image compression approaches applied in Earth Observation (EO) and offer an application specific insight into effects of an efficient lossy compression solution in this context. Besides a general overview of lossless and near-lossless techniques for compression of satellite based hyperspectral and multispectral images, which are mainly present in the currently used onboard and ground-based implementations of the EO data distribution systems, we will also focus on the compression techniques that are specifically oriented towards the ground segment and the specific end-user needs. In line with the above mentioned, we will consider different lossy compression solutions with the high compression gain and analyse the performance sensitivity of the thematic mapping application to different encoding scenarios. In comparison to usual constraints that are characteristic for the onboard signal processing and the corresponding downlink communication requirements, end-user oriented EO applications that are placed at the other end of the data distribution chain offer much broader range of design possibilities in the context of the data transmission and processing. In that sense, applications of different lossy compression schemes with higher image quality could be considered as acceptable solutions for such application scenarios, even at the cost of higher encoding complexity in comparison to onboard designs. However, performance of the specific EO applications that are utilizing such compressed data is usually more important than the general image quality, which makes the required sensitivity analysis of the specific applications a highly desirable research topic of interest.

Presented analyses are the result of the joint work with my colleagues Miloš Radosavljević and Predrag Lugonja.

Presentation link: https://www.youtube.com/watch?v=YrUrpBy0e6A