Project Proposal
on
SAR Image Compression

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Synthetic Aperture Radar (SAR) systems are used in satellites and aircraft systems. They use the movement of the antenna and signal processing to enlarge the effective aperture of the radar. Since radio waves of the frequency (1-10 GHz) used by SAR systems can propagate through rain drops, fog and clouds, SAR systems can take images of the target area in almost any weather condition. SAR images have applications in many areas such as agriculture, ecology, geology, oceanography, hydrology and pollution monitoring.

SAR images consist of pixels representing the energy reflected by a target. SAR images are significantly different in nature from optical images. Another difference is that SAR images are generally very large compared to typical optical images. This is a serious problem because these images need to be transmitted or stored in an aircraft or satellite as they are obtained. Therefore compression of the images is a very important step in the processing of SAR images. It is possible to apply various compression techniques which are commonly applied to optical images, but there is no guarantee that they will work as well as they worked for optical images [1].

In this project we propose to apply some common compression methods to SAR images and to compare the results in term of computational load, compression ratio and various quality metrics. We also propose to analyze the SAR images to understand their nature and to report whether this knowledge can be used to improve the compression techniques or propose new techniques. All these algorithms will be implemented using MATLAB.

References

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