Automated identification of slums in Hyderabad using high resolution satellite imagery

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The main goal of this thesis is to develop an approach to automated identification of slums using sub-metre resolution satellite imagery, and to apply the new method to the slum-plagued South Indian megacity of Hyderabad. This dissertation establishes a multi-step satellite imagery analysis framework, which is capable of performing rapid identification of slums in Hyderabad without extensive ground surveys or manual image analysis. It is based on the relation of a specific range of spatial heterogeneity expressed through lacunarity to the probability of an area to be morphologically similar to the surface texture of a slum. This dissertation contributes to the body of knowledge on remote sensing of human settlements and advanced image processing techniques and presents an essential instrument to be used by a the United Nations bodies, national and city governments as well as non-governmental organizations engaged in slum-related work.