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## Deep Learning based Automation for Rooftop Solar Potential Estimation using high-resolution UAV data

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The acquisition of data pertaining to built-up areas and the accessibility of their suitable vector format are crucial in a multitude of remote sensing applications. The adoption of a renewable energy generation method is inevitable in response to the escalating energy demand and to fulfill Sustainable Development Goals. Rooftop solar photovoltaic energy generating optimizes panel installation area efficiently and minimizes transmission losses. The process of identifying a suitable rooftop area for solar photovoltaic (PV) systems using a conventional approach to digitizing buildings through vectorization is not only laborious but also consumes a significant amount of time. The accurate and efficient creation of building rooftop extraction has posed a substantial and intricate challenge within the field of remote sensing. Though many strategies have been developed and these demonstrate a high level of efficacy in feature recognition and extraction but lack the integrity of geospatial information. This research introduces a model pipeline that aims to facilitate the transfer of geospatial information from the input image. Additionally, the proposed process has the capability to generate vector shapefiles representing the building rooftops and the capability of estimating the solar rooftop potential utilizing the extracted rooftop in a suitable format. This is developed as an open-source GUI to help decision makers and planners to easily utilize the developed pipeline.

**Keywords:** Remote sensing, GIS, Deep Learning, Automation, UAV data processing, Rooftop solar potential