

(54) Title of the invention : Automatic Fine Registration of satellite images based on enhanced sub pixel Phase Correlation Registration Method

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| <p>(51) International classification :A61B 050000, G06T 073200, G06T 073300, H04N 055000, H04N 214620</p> <p>(86) International Application No :PCT//<br/>Filing Date :01/01/1900</p> <p>(87) International Publication No : NA</p> <p>(61) Patent of Addition to Application Number :NA<br/>Filing Date :NA</p> <p>(62) Divisional to Application Number :NA<br/>Filing Date :NA</p> | <p>(71)Name of Applicant :<br/><b>1)Shrimathi Devkunvar Nanalal Bhatt Vaishnav College for Women</b><br/>Address of Applicant :Shrimathi Devkunvar Nanalal Bhatt Vaishnav College for Women, Chennai -----</p> <p><b>Name of Applicant : NA</b><br/><b>Address of Applicant : NA</b></p> <p>(72)Name of Inventor :<br/><b>1)Dr. G. B. Hema Malini</b><br/>Address of Applicant :Assistant Professor, Department of Computer Applications, Shrimathi Devkunvar Nanalal Bhatt Vaishnav College for Women, University of Madras, Chennai -----</p> <p><b>2)Dr. R. Radha</b><br/>Address of Applicant :Associate Professor, Department of Computer Science, Shrimathi Devkunvar Nanalal Bhatt Vaishnav College for Women, University of Madras, Chennai -----</p> |
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(57) Abstract :

Automatic fine registration of satellite images is a crucial task in remote sensing applications that involves aligning images acquired at different times, viewpoints, and with various sensors. In this invention, we propose a system that uses an enhanced sub-pixel phase correlation registration method for high-accuracy image registration. The system includes a pre-processing module, a fast Fourier transform module, a phase correlation module, and a sub-pixel registration module. An improved Blackman Window pre-processing task is used to reduce noise in the images, and the fast Fourier transform module is used to convert the images from the spatial domain to the frequency domain to reduce computational cost. The phase correlation module determines the phase difference between the Fourier transforms of the images, and the sub-pixel registration module estimates the sub-pixel shift between the images. The proposed system is evaluated using different satellite images, and the registration accuracy is compared using different metrics such as Ratio Image Uniformity (RIU), Root Mean Square Error (RMSE), and Structural Similarity Index Measure (SSIM). The results show that the proposed method outperforms other state-of-the-art methods, demonstrating its effectiveness and practicality for remote sensing applications.

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