

A REGION GROWING ALGORITHM FOR INSAR PHASE UNWRAPPING

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[A Region Growing Algorithm For Insar Phase Unwrapping](#)

A Region-Growing Algorithm for InSAR Phase Unwrapping Wei Xu, Member, IEEE, and Ian Cumming, Member, IEEE Abstract— This paper describes a new region-growing algo-rithm for interferometric synthetic aperture radar (SAR) phase unwrapping. The algorithm is designed to handle noisy interfer-ograms and based on the following principles.

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This paper describes a new region-growing algorithm for interferometric synthetic aperture radar (SAR) phase unwrapping. The algorithm is designed to handle noisy interferograms and based on the following principles. 1) Unwrapping is carried out on the perimeter of "growth regions," and these regions are allowed to grow with consistency checking. 2) Phase information from neighboring pixels is used to predict the correct phase of each new pixel to be un wrapped. 3) Reliability check is ...

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Keywords: Phase unwrapping, Region-growing, Cut-line, Weighted least squares, DEM Introduction. Phase unwrapping has been a difficult step in interferometric SAR processing. A number of phase unwrapping algorithms for SAR interferograms have been proposed. However, none of the existing phase unwrapping algorithms give satisfactory results when noisy and/or dense fringes occur. We have ...

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W. Xu and I. Cumming, "A region-growing algorithm for InSAR phase unwrapping," IEEE Trans. Geosci. Remote Sens. 37 (1), 124–134 (1999).

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A region growing algorithm for insar phase unwrapping (1996) by W Xu, I Cumming Venue: in Proceedings of the 1996 International Geoscience and Remote Sensing Symposium-IGARSS'96: Add To MetaCart . Tools. Sorted by: Results 1 - 10 of 32. Next 10 ? Synthetic Aperture Radar Interferometry by Paul A. Rosen, Scott Hensley, Ian R. Joughin, Fuk K. Li, Søren N. Madsen, Ernesto Rodriguez, Richard ...

[Extended Kalman Filter Phase Unwrapping Smooth Algorithm ...](#)

A region-growing algorithm for InSAR phase unwrapping Xu, Wei; Cumming, I. Abstract. Not Available . Publication: IEEE Transactions on Geoscience and Remote Sensing. Pub Date: January 1999 DOI: 10.1109/36.739143 Bibcode: 1999ITGRS..37..124X full text sources ...

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InSAR Phase Unwrapping Algorithms with the Aid of GPS Control Points: LUO Haibin 1, HE Xiufeng 2: 1 School of Geography and Remote Sensing, Nanjing University of Information Science and Technology, Nanjing 210044, China; 2 Institute of Satellite Navigation and Spatial Information System, Hohai University, Nanjing 210098, China

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Abstract — This paper describes a new region-growing algorithm for interferometric synthetic aperture radar (SAR) phase unwrapping. The algorithm is designed to handle noisy interferograms and based on the following principles. 1) Unwrapping is carried out on the perimeter of "growth regions, " and these regions are allowed to grow with consistency checking. 2) Phase information from neighboring pixels is used to predict the correct phase of each new pixel to be unwrapped. 3 ...

[How to Phase Unwrap an Interferogram | ASF](#)

A two-dimensional region growing least squares phase unwrapping algorithm for interferometric SAR processing Abstract: This paper presents a new two-dimensional (2-D) phase unwrapping (PhU) algorithm based on a least squares (LS) region growing strategy: the wrapped phase image is partitioned in different regions that are sequentially unwrapped via a LS algorithm.

[Improved phase unwrapping algorithm based on NVIDIA CUDA ...](#)

A phase unwrapping algorithm was introduced and modified by use of demodulated FFT signals instead of DCT, thus emulating the DCT properties. The method works with the original dimension (N) of phase image instead of its doubled (2 N) dimension, which decreases the number of operations, and thus the time of computation, by a factor of 4 (1 + 1 log 2 N) .

[A region-cutting InSAR phase unwrapping algorithm based on ...](#)

In order to avoid or at least minimize false phase jumps, a multitude of phase unwrapping algorithms have been proposed over the years, including region-growing algorithms , discontinuity minimization algorithms , minimum Lp-norm and least-squares algorithms, quality-guided [23,24] and network flow algorithms, branch-cut algorithms and flood-fill algorithms.

[A new synthesis algorithm for InSAR phase unwrapping](#)

PROCESSING STRATEGIES FOR PHASE UNWRAPPING FOR INSAR APPLICATIONS Charles L. Werner, ... including regions with very high noise and phase discontinuities. The introduction of the MCF and triangulation paradigms significantly improves the robustness and applicability of SAR interferometry to geophysical research. The commercial availability of these algorithms is leading to wide spread ...

[CiteSeerX — Citation Query A novel phase unwrapping method ...](#)

We have developed a new region-growing phase unwrapping algorithm, which can cope with very noisy interferograms . The verification of the unwrapped phase of the noisy Sardegna interferogram will help to compare the performance of the algorithms. The Region Growing Algorithm. The success of phase unwrapping algorithms often depends upon the path selected to perform the unwrapping, or the lack ...

[Discontinuity preserving phase unwrapping algorithm for ...](#)

A region growing algorithm for InSAR phase unwrapping. International Geoscience and Remote Sensing Symposium, May 1996, pp. 2044-2046. Google Scholar . Pritt M.D. Phase unwrapping by means of multigrid techniques for interferometric SAR. IEEE Transactions on Geoscience and Remote Sensing, May 1996, pp. 728-738. Google Scholar. Costantini M. A novel phase unwrapping method based on network ...

[An InSAR phase unwrapping algorithm with the phase ...](#)

A fresh phase unwrapping algorithm based on iterated unscented Kalman filter is proposed to estimate unambiguous unwrapped phase of interferometric fringes. This method is the result of combining an iterated unscented Kalman filter with a robust phase gradient estimator based on amended matrix pencil model, and an efficient quality-guided strategy based on heap sort.

[Kalman filter phase unwrapping algorithm of SAR ...](#)

By exploiting the phase of the coherent radar signal, interferometry has transformed radar remote sensing from a largely interpretive science to a quantitative tool, with applications in cartography, geodesy, land cover characterization, and natural hazards. This paper reviews the techniques of interferometry, systems and limitations, and applications in a rapidly growing area of science and ...

[Fast and robust three-dimensional best path phase ...](#)

Reference [1] Yuan xiaokang,?Introduce to the Spaceborne Synthetic Aperture Radar? [2] Wang chao, Zhang hong, Liu zhi,?Interferometry Measurement of the Spaceborne Synthetic Aperture Radar? [3] Wei Xu, and Ian Cumming, A Region-Growing Algorithm for InSAR Phase Unwrapping, IEEE Trans, VOL. 37, NO. 1, JANUARY 1999 124?126 [4] S.B. Kim and Y.-S. Kim, Least squares phase unwrapping in ...

[Evaluation of a Cubature Kalman Filtering-Based Phase ...](#)

Efficient Phase Unwrapping Algorithm Based on Fringe Projection Applying Reliability-Guided Technique. Article Preview. Abstract: We present a new method to define the reliability of pixel and path of phase unwrapping. The reliability function is calculated based on modulation, second difference of wrapped phase, and second difference of modulation, and then we present the concept of smoothness ...

[Region-growing phase unwrapping method based on mask](#)

Witoszynskij S, Rauscher A, Reichenbach J R and Barth M 2009 Phase unwrapping of MR images using Phi UN-a fast and robust region growing algorithm Med. Image Anal. 13 257-68 Crossref PubMed Xu W and Cumming I 1999 A region-growing algorithm for InSAR phase unwrapping IEEE Trans. Geosci.

[A reliable phase unwrapping algorithm based on the local ...](#)

Then our algorithm combining with the weighted least square phase unwrapping guided by the branch-cuts derived from Goldstein's algorithm and coherence coefficient map derived from the INSAR data is provided. In our experiment we write subroutines of the Goldstein's branch-cut algorithm, unweighted and weighted least square phase unwrapping algorithm as well as our algorithm, and construct a ...

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