Phase Unwrapping Algorithms For Radar Interferometry

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Phase Unwrapping Algorithms For Radar
Phase unwrapping algorithms for radar interferometry: residue-cut, least-squares, and synthesis algorithms. Howard A. Zebker and Yanping Lu. Department of Geophysics, Stanford University, Stanford, California 94305-2215. Received May 5, 1997; accepted September 18, 1997; revised manuscript received October 9, 1997 The advent of interferometric synthetic aperature radar for geophysical studies has resulted in the need for accurate, efficient methods of two-dimensional phase unwrapping.

Phase unwrapping algorithms for radar interferometry ...
While phase unwrapping algorithms have proliferated over the past ten years, two main approaches are currently in use. Each is most useful only for certain restricted applications. All these algorithms begin with the measured gradient of the phase field, which is subsequently integrated to recover the unwrapped phases.

OSA | Phase unwrapping algorithms for radar interferometry ...
Phase Unwrapping Algorithms for Radar Interferometry: Residue-Cut, Least-Squares, and Synthesis Algorithms Abstract: The advent of interferometric SAR for geophysical studies has resulted in the need for accurate, efficient methods of two-dimensional phase unwrapping. Inference of the lost

Phase Unwrapping Algorithms for Radar Interferometry ...
Get Free Phase Unwrapping Algorithms For Radar Interferometry that the measuredphase signal can only take on values in a range, whilst the original phase signal can take on any value. That is, leads to artificial phase jumps being introduced near boundaries. A Fast, Automated, N-Dimensional Phase Unwrapping Algorithm The phase of the radar ...

Phase Unwrapping Algorithms For Radar Interferometry
Phase unwrapping is a mathematical problem-solving technique increasingly used in synthetic aperture radar (SAR) interferometry, optical interferometry, adaptive optics, and medical imaging. In Two-Dimensional Phase Unwrapping, two internationally recognized experts sort through the multitude of ideas and algorithms cluttering current research, explain clearly how to solve phase unwrapping problems, and provide practicable algorithms that can be applied to problems encountered in diverse ...

Two-Dimensional Phase Unwrapping: Theory, Algorithms, and ...
Phase unwrapping is a problem that occurs in several fields as diverse as Synthetic Aperture Radar and MR Angiography. In all cases the problem is that the measuredphase signal can only take on values in a range, whilst the original phase signal can take on any value.

A Fast, Automated, N-Dimensional Phase Unwrapping Algorithm
Two-dimensional phase unwrapping is the process of recovering unambiguous phase data from a 2-D array of phase values known only modulo 2pi rad. SNAPHU is an implementation of the Statistical-cost, Network-flow Algorithm for Phase Unwrapping proposed by Chen and Zebker (see references below). This algorithm poses phase unwrapping as a maximum a posteriori probability (MAP) estimation problem, the objective of which is to compute the most likely unwrapped solution given the observable input data.

SNAPHU: Statistical-Cost, Network-Flow Algorithm for Phase ...
The phase of the radar echoes may only be measured modulo 2 pi; however, the whole phase at each point in the image is needed to obtain elevations. An approach to 'unwrapping' the 2 pi ambiguities...

Satellite Radar Interferometry: Two-Dimensional Phase ...
Navigate to Radar > Interferometric > Unwrapping > Snaphu Import; In the Snaphu Import window: In the Read Phase tab, select the interferogram product; In the Read Unwrapped Phase tab, navigate to your Snaphu export folder and select the UnwPhase_XXX.hdr file. Exported products must be extracted if they were transferred in a zip file.

How to Phase Unwrap an Interferogram | ASF
A wide range of interferometric techniques recover phase information that is mathematically wrapped on the interval (- π, π]. Obtaining the true unwrapped phase is a longstanding problem. We present an algorithm that solves the phase unwrapping problem, using a combination of Fourier techniques.

OSA | Fast phase unwrapping algorithm for interferometric ...
Abstract and Figures Phase unwrapping is the mathematical problem-solving that appears in several research areas such as: Interferometric Synthetic Aperture Radar (InSAR), optical interferometry...

(PDF) 2-D Phase Unwrapping Algorithm Based on ...
Phase unwrapping is the process of restoring the correct multiple of 2π to each point of the interferometric phase image. For a well-behaved smooth phase field all the unwrapped phase differences between adjacent interferogram samples lie between -π and +π. When this is true, phase unwrapping is straightforward.

PROCESSING STRATEGIES FOR PHASE UNWRAPPING FOR INSAR ...
* A discussion of future trends in phase unwrapping research * Foreword by former NASA scientist Dr. John C. Curlander Two-Dimensional Phase Unwrapping skillfully integrates concepts, algorithms, software, and examples into a powerful benchmark against which new ideas and algorithms for phase unwrapping can be tested.

Two-Dimensional Phase Unwrapping: Theory, Algorithms, and ...
Phase unwrapping (PU) is one of the key processes in measuring the elevation or deformation of the Earth’s surface from its interferometric synthetic aperture radar (InSAR) data. PU problems may be formulated as maximum a posteriori estimation estimations of Markov random field (MRF). The key issue of this formulation is energy minimization.

Comparison of optimization algorithms for interferometric ...
Abstract—Two-dimensional (2-D) phase unwrapping is a key step in the analysis of interferometric synthetic aperture radar (InSAR) data. While challenging even in the best of circumstances, this problem poses unique difficulties when the dimensions of the interferometric input data exceed the limits of one’s computational capabilities.

CiteSeerX — Citation Query A novel phase unwrapping method ...
Two-dimensional phase unwrapping is the process of recovering unambiguous phase data from a 2-D array of phase values known only modulo 2pi rad. SNAPHU is an implementation of the Statistical-cost, Network-flow Algorithm for Phase Unwrapping proposed by Chen and Zebker.

SNAPHU | STEP
Phase can be unwrapped by the 3D phase unwrapping algorithm as long as the phase distribution is correlated in neighboring B-scans. In other words, phase can be unwrapped if the phase distribution does not change abruptly in successive B-scans due to sparse scanning and/or temporal changes in the blood flow when they slower than the acquisition speeds of the B-scans.

Computationally effective 2D and 3D fast phase unwrapping ...
Automatic phase unwrapping algorithms in Synthetic Aperture Radar (SAR) Interferometry. IEICE Transactions on Electronics, E83C (12):1896-1904. Chen, C. W. and Zebker, H. A., 2001. Two-dimensional phase unwrapping with use of statistical models for cost functions in nonlinear optimization.

Data Recipes — Further Reading | ASF
Given an input interferogram and other observable data, snaphu attempts to compute congruent phase-unwrapped solutions that are maximally probable in an approximate a posteriori sense. The algorithm’s solver routine is based on network optimization.

snaphu - Stanford University
The LBP algorithm performs surprisingly poorly on solving phase discontinuities issue, whereas the TRW-S algorithm does quite well (second only to the GC algorithm). Phase unwrapping (PU) is one of the key processes in measuring the elevation or deformation of the Earth's surface from its interferometric synthetic aperture radar (InSAR) data.