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| **Si** | **01**-Suzanne Lyons and David Sandwell. (2003). ***Fault creep along the southern San Andreas from interferometric synthetic aperture radar, permanent scatterers, and stacking.*** JOURNAL OF GEOPHYSICAL RESEARCH, 108, 1-24. | Interferometric synthetic aperture radar (InSAR) provides a practical means of mapping creep along major strike-slip faults. The small amplitude of the creep signal (<10 mm/yr), combined with its short wavelength, makes it difficult to extract from long time span interferograms, especially in agricultural or heavily vegetated areas. We utilize two approaches to extract the fault creep signal from 37 ERS SAR images along the southern San Andreas Fault. First, amplitude stacking is utilized to identify permanent scatterers, which are then used to weight the interferogram prior to spatial filtering. This weighting improves correlation and also provides a mask for poorly correlated areas. Second, the unwrapped phase is stacked to reduce tropospheric and other short-wavelength noise. This combined processing enables us to recover the near-field (200 m) slip signal  across the fault due to shallow creep. Displacement maps from 60 interferograms reveal a diffuse secular strain buildup, punctuated by localized interseismic creep of 4–6 mm/yr line of sight (LOS, 12–18 mm/yr horizontal). With the exception of Durmid Hill, this entire segment of the southern San Andreas experienced right-lateral triggered slip of up to 10 cm during the 3.5-year period spanning the 1992 Landers earthquake. The deformation change following the 1999 Hector Mine earthquake was much smaller (<1 cm) and broader than for the Landers event. Profiles across the fault during the interseismic phase show peak-to-trough amplitude ranging from 15 to 25 mm/yr (horizontal component) and the minimum misfit models show a range of creeping/locking depth values that fit the data. |  |
| **No totalmente** | **02**-Parker J., Glasscoe M., Donnellan A., Stough T., Pierce M., Wang J. (2018) ***Radar Determination of Fault Slip and Location in Partially Decorrelated Images***. In: Zhang Y., Goebel T., Peng Z., Williams C., Yoder M., Rundle J. (eds) Earthquakes and Multi-hazards Around the Pacific Rim, Vol. I. Pageoph Topical Volumes. Birkhäuser, Cham  https://doi.org/10.1007/s00024-016-1403-z  Radar Determination of Fault Slip and Location in Partially Decorrelated Images  Keywords  Radar interferometry fault slip computer vision Canny algorithm | Faced with the challenge of thousands of frames of radar interferometric images, automated feature extraction promises to spur data understanding and highlight geophysically active land regions for further study. We have developed techniques for automatically determining surface fault slip and location using deformation images from the NASA Uninhabited Aerial Vehicle Synthetic Aperture Radar (UAVSAR), which is similar to satellite based SAR but has more mission flexibility and higher resolution (pixels are approximately 7 m). This radar interferometry provides a highly sensitive method, clearly indicating faults slipping at levels of 10 mm or less. But interferometric images are subject to decorrelation between revisit times, creating spots of bad data in the image. Our method begins with freely available data products from the UAVSAR mission, chiefly unwrapped interferograms,coherence images, and flight metadata. The computer vision techniques we use assume no data gaps or holes; so a preliminary step detects and removes spots of bad data and fills these holes by interpolation and blurring. Detected and partially validated surface fractures from earthquake main shocks, aftershocks, and aseismicinduced slip are shown for faults in California, including El MayorCucapah (M7.2, 2010), the Ocotillo aftershock (M5.7, 2010), and South Napa (M6.0, 2014). Aseismic slip is detected on the San Andreas Fault from the El Mayor-Cucapah earthquake, in regions of highly patterned partial decorrelation. Validation is performed by comparing slip estimates from two interferograms with published ground truth measurements. | *Price, E. J., & Sandwell, D. T. (1998). Small-scale deformations associated with the 1992 Landers, California, earthquake mapped by synthetic aperture radar interferometry phase gradients. Journal Geophysical Research, 103, 27001–27016.*  **06**-Canny, J. (1986). A computational approach to edge detection. IEEE Transactions on Pattern Analysis and Machine Intelligence, 6, 679–698. “-This paper describes a computational approach to edge  detection. The success of the approach depends on the definition of a comprehensive set of goals for the computation of edge points. These goals must be precise enough to delimit the desired behavior of the detector while making minimal assumptions about the form of the solution. We define detection and localization criteria for a class of edges,and present mathematical forms for these criteria as functionals on the operator impulse response. A third criterion is then added to ensure that the detector has only one response to- a single edge. We use the criteria in numerical optimization to derive detectors for several common image features, including step edges. On specializing the analysis to step edges, we find that there is a natural uncertainty principle between detection and localization performance, which are the two main goals.” |
| **Si** | **03-**Xiang, Y.; Wang, F.; Wan, L.; You, H. ***SAR-PC: Edge Detection in SAR Images via an Advanced Phase Congruency*** Model. Remote Sens. **2017**, 9, 209. | Edge detection in Synthetic Aperture Radar (SAR) images has been a challenging task due to the speckle noise. Ratio-based edge detectors are robust operators for SAR images that provide constant false alarm rates, but they are only optimal for step edges. Edge detectors developed by  the phase congruency model provide the identification of different types of edge features, but they suffer from speckle noise. By combining the advantages of the two edge detectors, we propose a SAR phase congruency detector (SAR-PC). Firstly, an improved local energy model for SAR images is obtained by replacing the convolution of raw image and the quadrature filters by the ratio responses.Secondly, a new noise level is estimated for the multiplicative noise. Substituting the SAR local energy and the new noise level into the phase congruency model, SAR-PC is derived. Edge response corresponds to the max moment of SAR-PC. We compare the proposed detector with the ratio-based edge detectors and the phase congruency edge detectors. Receiver Operating Characteristic (ROC) curves and visual effects are used to evaluate the performance. Experimental results of simulated images and real-world images show that the proposed edge detector is robust to speckle noise and it provides a consecutive edge response. |  |
|  | **04-**G. Ferraioli, ***"Multichannel InSAR Building Edge Detection,"*** in IEEE Transactions on Geoscience and Remote Sensing, vol. 48, no. 3, pp. 1224-1231, March 2010.doi: 10.1109/TGRS.2009.2029338 | “In this paper, the problem of building edge detection in synthetic aperture radar images is addressed. A new stochastic approach based on local Gaussian Markov random field (LGMRF) is proposed. The algorithm finds the edges of buildings starting from the estimation of the hyperparameters of the LGMRF model. The hyperparameters are seen as an indicator of the spatial correlation between adjacent pixels. The procedure is applied on interferometric data, using single-channel and multichannel configurations. The algorithm has been tested on simulated and real data, providing good results in both cases.” | Shunping Ji, Shiqing Wei, Meng Lu, "A scale robust convolutional neural network for automatic building extraction from aerial and satellite imagery", International Journal of Remote Sensing, pp. 1, 2018. |
|  | **05-**B. Kanoun, G. Ferraioli, V. Pascazio and G. Schirinzi, ***"Fast Algorithm for Despeckling Sentinel-1 SAR Data,"*** EUSAR 2018; 12th European Conference on Synthetic Aperture Radar, Aachen, Germany, 2018, pp. 1-5.URL: http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8438219&isnumber=8437291 |  |  |
|  | *F. Baselice, G. Ferraioli and V. Pascazio, "Man-made structure edge detector using a single Cosmo-SKYMED Spotlight image," 2012 IEEE International Geoscience and Remote Sensing Symposium, Munich, 2012, pp. 6645-6648.*  doi: 10.1109/IGARSS.2012.6352075  **keywords: {edge detection;geophysical image processing;remote sensing by radar;synthetic aperture radar;man made structure edge detector;Cosmo-SKYMED spotlight image;Spotlight Synthetic Aperture Radar;SAR Images;Image edge detection;Detectors;Synthetic aperture radar;Signal processing algorithms;Buildings;Periodic structures;Urban areas;SAR Edge Detection;Markov Random Fields;Cosmo-SKYMED Spotlight configuration},**  URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=6352075&isnumber=6350328> |  | 03-F. Baselice, G. Ferraioli, and V. Pascazio, "Building edge detection from sar amplitude and phase data," in Urban Remote Sensing Event (JURSE), 2011 Joint, april 2011, pp. 193 -196. |
|  | 04-Parker, J., Glasscoe, M., Donnellan, A. et al. Pure Appl. Geophys. (2017) 174: 2295. |  | 05-Canny, J. (1986). A computational approach to edge detection. IEEE Transactions on Pattern Analysis and Machine Intelligence, 6, 679–698. |
|  | B. Kanoun, G. Ferraioli, V. Pascazio and G. Schirinzi, "Fast Algorithm for Despeckling Sentinel-1 SAR Data," EUSAR 2018; 12th European Conference on Synthetic Aperture Radar, Aachen, Germany, 2018, pp. 1-5.  URL: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8438219&isnumber=8437291> |  | G. Ferraioli, "Multichannel InSAR Building Edge Detection," in *IEEE Transactions on Geoscience and Remote Sensing*, vol. 48, no. 3, pp. 1224-1231, March 2010.  doi: 10.1109/TGRS.2009.2029338 |
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