Print

Submitted

on August 18, 03:17 PM

for agu-fm09

Christopher Gifford Paid: $30.00, Transaction #: 041719

Credit Card Type: Visa

Credit Card Number: xxxxxxxxxxxx9624

Your abstract appears below.

Please print a copy of this page for your records.

To return to the Submission Center and check your list of submissions; click "View Submissions" in the left menu.

 Proof

CONTROL ID: 696280

TITLE: Automatic Ice Thickness Estimation from Polar Subsurface Radar Imagery

PRESENTATION TYPE: Poster Requested

SECTION/FOCUS GROUP: Cryosphere (C)

SESSION: Remote Sensing of the Cryosphere (C09)

AUTHORS (FIRST NAME, LAST NAME): Christopher M Gifford[1], Gladys Finyom[1], Michael Jefferson[1], MyAsia Reid[1], Eric L Akers[2], Arvin Agah[1]
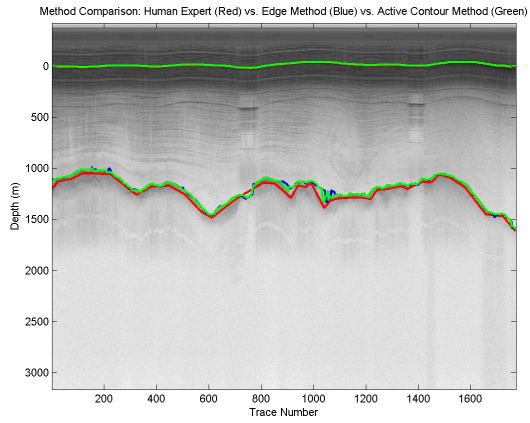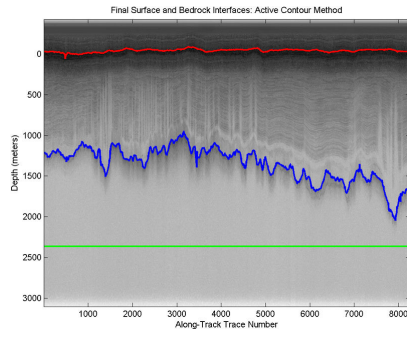
INSTITUTIONS (ALL): 1. Center for Remote Sensing of Ice Sheets, University of Kansas, Lawrence, KS, USA.
2. Mathematics and Computer Science Department, Elizabeth City State University, Elizabeth City, NC, USA.

ABSTRACT BODY: This work focuses on automating the tedious task of estimating ice thickness from airborne radar data acquired over Greenland and Antarctica. This process involves the identification and accurate selection of the ice sheet's surface location and interface between the ice sheet and underlying bedrock for each measurement. Knowing the surface and bedrock locations in the radar imagery allows us to compute ice sheet thickness, which is very important for the study of ice sheets, their volume, and how they may contribute to climate change issues. The previous time-consuming manual approach required sparse hand-selection of surface and bedrock interfaces by several human experts, and interpolating between selections to save time. Two primary methods have been studied: edge-based, and active contour. Results are compared and presented in terms of time requirements, error, and advantages which each method offers. Automatic ice thickness estimation results from 2006 and 2007 Greenland field campaigns show that the edge-based approach offers faster processing (seconds compared to minutes), but suffers from a lack of continuity and smoothness aspects that active contours provide. The active contour approach is more accurate when compared to ground truth selections from human experts, and has proven to be more robust to image artifacts.

INDEX TERMS: [0726] CRYOSPHERE / Ice sheets, [0758] CRYOSPHERE / Remote sensing, [0794] CRYOSPHERE / Instruments and techniques, [1906] INFORMATICS / Computational models, algorithms.

(No Table Selected)

Final Surface and Bedrock Interfaces: Active Contour Method

Method Comparison: Human Expert (Red) vs. Edge Method (Blue) vs. Active Contour Method (Green)

Additional Details

Previously Presented Material: 0%

Scheduling Request: None