

Surface Ship Detection from Active Sonar Image Data

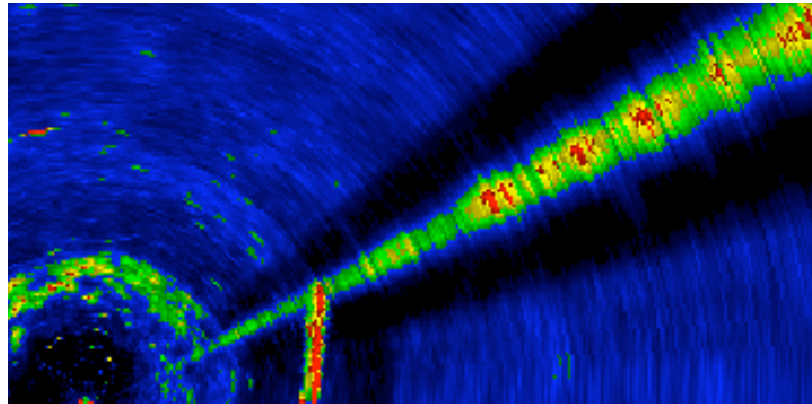
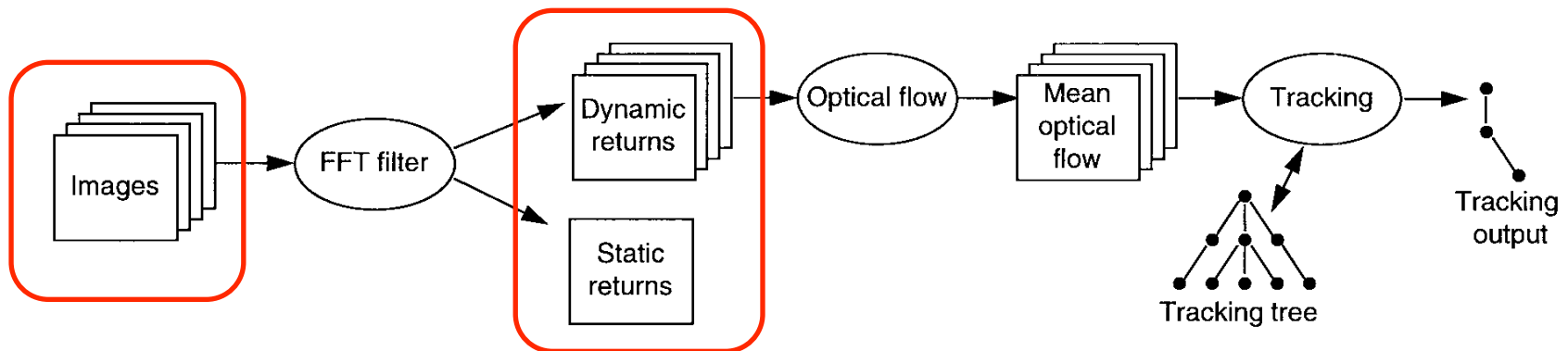


Image from Applied Research Labs, UT

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Optical Flow Method

- separate static image and dynamic return sequence via time-domain filtering
- input images must be exactly aligned



Processing stages for moving object detection, motion characterization, and tracking.

[Lane, Chantler, & Dai 1996]

Clutter Map Processing

- Geometric fading algorithm
- Suppress image features that appeared in previous frames
- Only works if successive images are exactly aligned

Figure from Lo & Ferguson, 2004

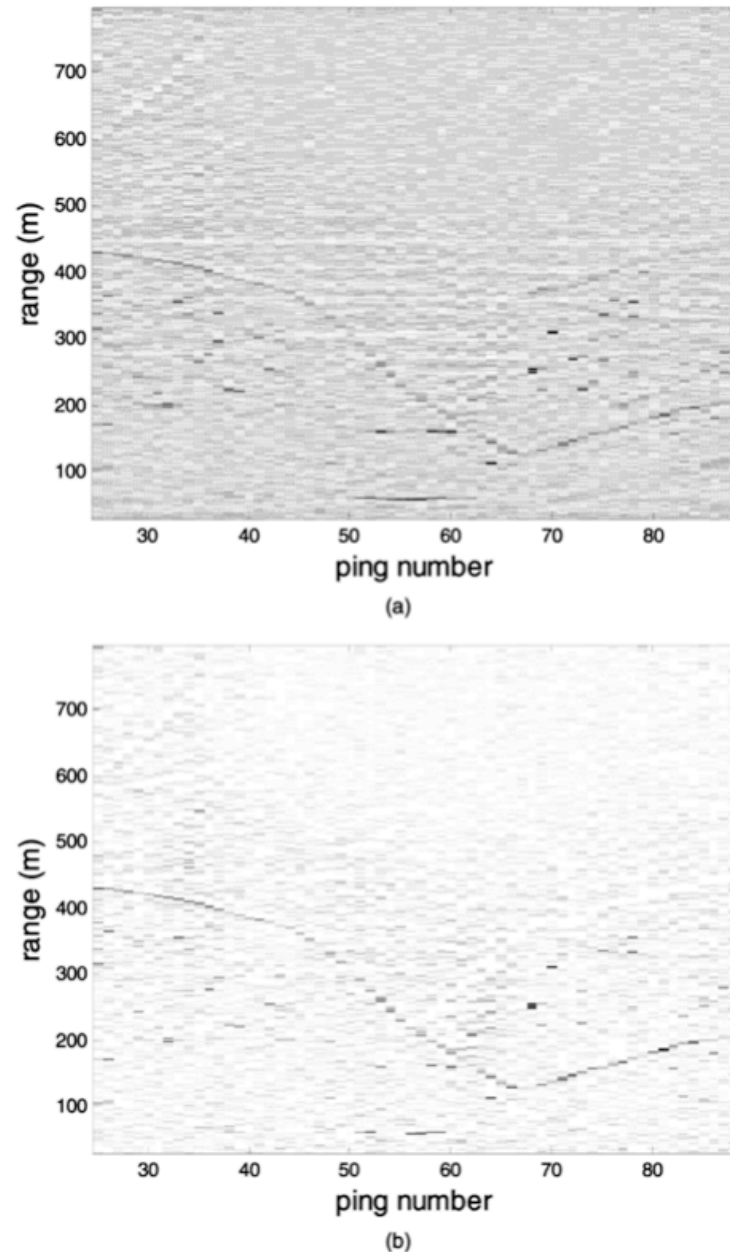


Fig. 5. Intensity plots of range profile at estimated target angle as function of ping number and range for the cases of (a) without clutter map processing, and (b) with clutter map processing.

Moving Platform Problem: must align images

- Previous work: fixed platform or target
- Current work: moving platform and target
- Inertial & compass data too coarse
- Manual ad-hoc image alignment works*
- Proposal: use coarse navigation data as an initial constraint for automatic image alignment