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ON FAST FEATURE EXTRACTION (FFE)

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ABSTRACT

In resorting to powerful feature extraction
methods in remotely sensed imagery the process can
become computationally very intensive. This has
been the case in efforts to detect and estimate
from Landsat imagery the sesonal coverage of snow
in the icelandic highlands, in particular the
boundary between the new and the old snow on
glaciers early in the summer.

Extracting dominant features from 4 to 7
different spectral bands in each satelite image
(Landsat MSS, Thematic Mapper) with principal
component analysis is an overburdening task to
common microcomputer based workstations for Land-
sat-data, if the problem is approached convention-
ally. This was the case with the most powerful
workstation of our laboratory, an in house develop-
ment based on a fast version (12 MHz) of the modern
Motorola MC 68000 32 bit microprocessor series.
Therefore this should also be the case for more
widely known workstations with less computing
power, like EBBA II (Sweden) and SPECTRAL DATA II
(USA).

A solution was achieved by implementing a
"fast algorithm" on special hardware adapted to
our workstation, with more than an order of magni-
tude improvement. This approach has also been
implemented on the new IBM PC AT, modified and
extended by us for image processing. This imple-
mentation, which should be of general interest,
applied to the above problem is the subject of our
presentation.