KAWASAKI STEEL TECHNICAL REPORT
No.27 (November 1992)
Hot-Rolled, Cold-Rolled and
Surface Coated Steel Sheets
and Electronics and Instrumentation

Image Processing System with a New Systolic Array LSI

Akira Ichinose, Kenji Suzuki, Yoshinori Wakimoto, Mitsuru Yanagisawa, Yuichiro Asano

---

Synopsis :

KAWASAKI STEEL TECHNICAL REPORT No. 27 November 1992

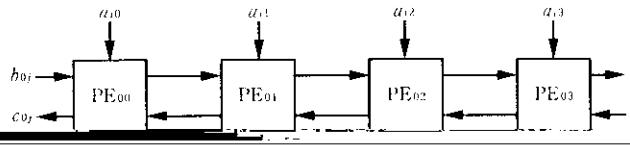
Image Processing System with a New Systolic Array LSI*

[redacted]

Synopsis:

An LSI with [redacted] systolic [redacted]

image is insufficient to handle all applications. An



user of an image processing board employing such an LSI can obtain high performance, until the limit of the array size is reached. Once this limit is exceeded, however, performance suddenly drops. As a result,

Table 1 LSI function list

[redacted]	[redacted]
Two-dimensional convolution	[redacted]
Matrix-vector multiplication	[redacted]
Gray scale transformation with lookup table	[redacted]

previous processing. The processing proceeds as follows: (1) The image data are read from a memory block; [redacted] array to carry out the convolution operation; (4) the output level is adjusted by the parallel shifter (level [redacted]

Table 2 Performance comparisons—image processing time for convolution of 512 × 512 8-bit

3 × 3	2 000	6.6	13.1	13.1	6.6

a WS, control is transferred to Dr. IMAGE II. The LSI

Table 3 Hardware component function list

tical, the architecture could be simplified and independent operation of Dr. IMAGE II became possible. Communication between the WS and Dr. IMAGE II are

Dr. IMAGE II, which has the following features:
(1) The image size and kernel size are variable so that a large image size (up to 4,096 × 4,096 pixels) from the