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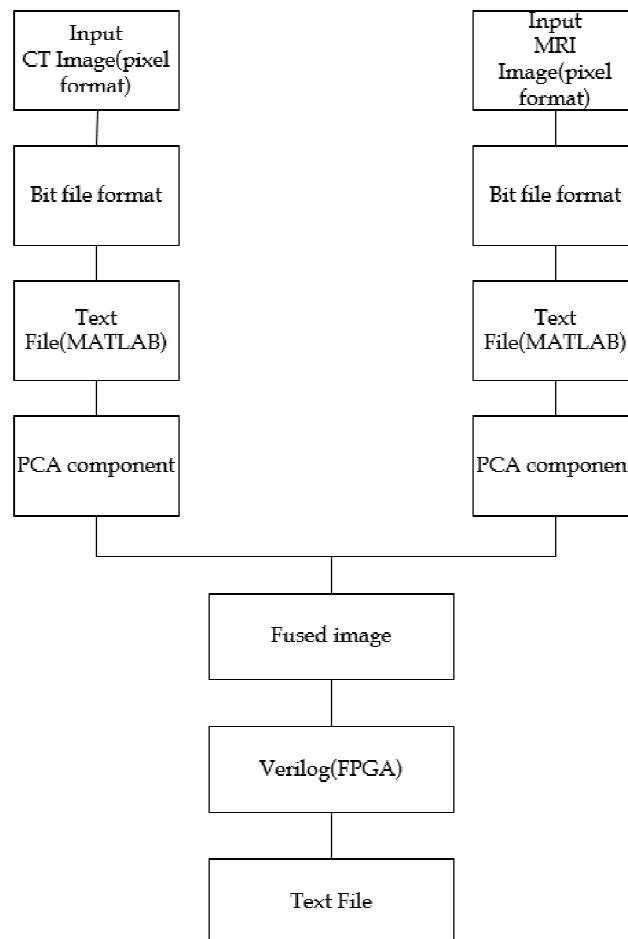
FPGA Implementation of Medical Image Fusion

P. Madhanraj¹, M. Jeshwanth Raj², Mrs Princy Magdaline P³

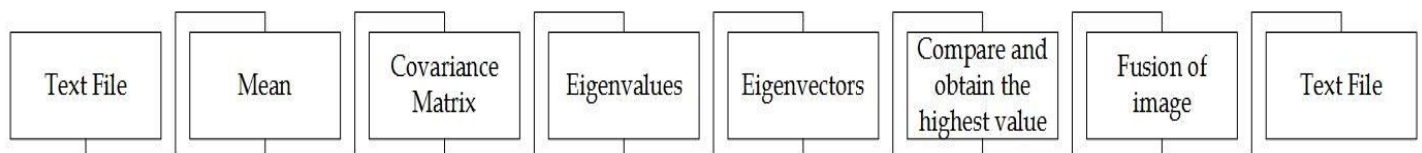
I. OBJECTIVE

- 1) To combine Computed Tomography(CT) and Magnetic Resonance Image(MRI)
- 2) To obtain clear images
- 3) To maintain the accuracy – PCA

II. BLOCK DIAGRAM



III. IMPLEMENTATION OF PCA ALGORITHM IN FPGA



IV. COVARIANCE MATRIX

- 1) To measure the amount of dependency between two variables.
- 2) A positive covariance - values are large.
- 3) A negative covariance - large values associated with small values.
- 4) Depends on the scale of the variable.

V. PROPOSED SYSTEM

Steps Involved In Obtaining Components Of Pca Algorithm

- 1) Covariance Matrix
- 2) Eigenvalues and Eigenvectors
- 3) Sorting and comparing the highest value obtained which contains most of the information
- 4) The Value is multiplied with the original image and added
- 5) The fused image will be obtained

VI. IMPLEMENTATION FLOW

- 1) Image – text file using Matlab
- A. *VERILOG*
- 1) Text File – Hexadecimal values of image
 - 2) Mean
 - 3) hex values gives individual pixel intensity for entire image
 - 4) Variance
 - 5) to classify regions (i.e) variation between neighbouring pixels
 - 6) Covariance
 - 7) changes existing between neighbouring values
 - 8) Output will be correlated values which reduce the dimensions of an image • In the form of a matrix

VII. IMPLEMENTATION FLOW (CONTD)

- 1) Eigenvectors
- 2) Direction of the new space
- 3) Eigenvalue
- 4) Magnitude of the new space
- 5) Sorting the eigenvalues and eigen vectors in descending order
- 6) Eigenvector with highest eigenvalue is significant • Contains the maximum information of the image
- 7) Image fusion
- 8) Highest value is multiplied with the original image
- 9) Original image is fused
- 10) Convert to text file
- 11) Values are converted to text
- 12) Output is verified in Matlab by converting the text file to an image

VIII. TOOLS REQUIRED

- A. *Software*
- 1) Matlab
 - 2) Xilinx ISE (Verilog)
- B. *Hardware*
- 1) Spartan3 FPGA
 - 2) PC



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