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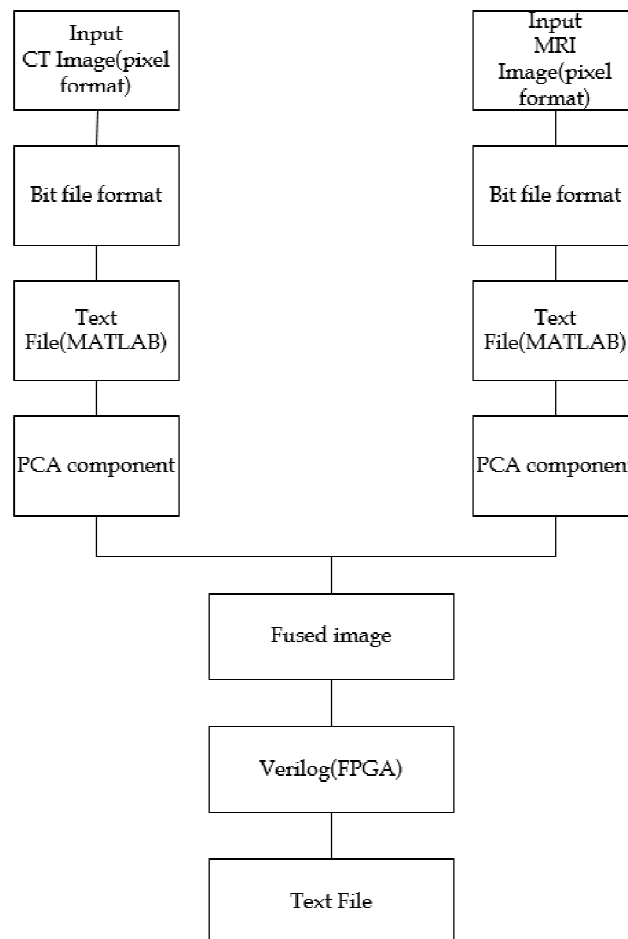
# FPGA Implementation of Medical Image Fusion

P. Madhanraj<sup>1</sup>, M. Jeshwanth Raj<sup>2</sup>, Mrs Princy Magdaline P<sup>3</sup>

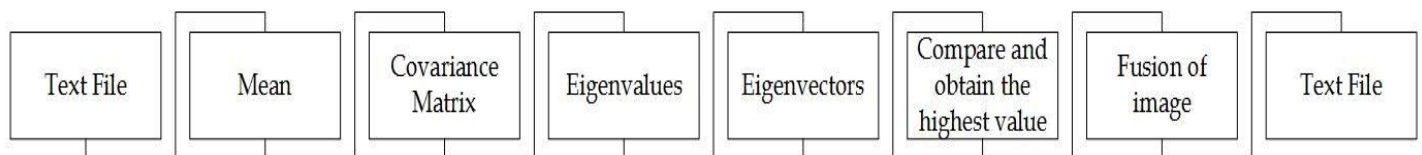
## I. OBJECTIVE

- 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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45.98



IMPACT FACTOR:  
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