Name of the Scholar	:	**Arun Kumar**
Name of the Supervisor	:	**Prof. Abdul Quaiyum Ansari**
		Department of Electrical Engineering,
		Faculty of Engineering and Technology, JMI.
Name of the Co-Supervisor	:	**Prof. Mohammad S. Hashmi**
		Department of Electronics & Communication Engg,
		IIIT Delhi.
Name of the Department/Centre	:	**Department of Electrical Engineering,**
		Faculty of Engineering and Technology, JMI
Topic of Research	:	**Application and Analysis of Wavelets in Accelerating Electromagnetic Code Computation**

Finding

All the electronic components are working on the principle of electromagnetism. Due to electromagnetism, there are many associated electromagnetic (EM) problems. Wavelet has emerged as an efficient and rapid solution for handling various EM problems. In this thesis, we have reviewed many algorithms and concluded that which wavelet is suitable for fast solution of EM problems.

A novel wavelet algorithm has been proposed for solving second order electromagnetic problems both in time and space domains. The algorithm has been used to solve four different problems, i.e. the transmission line problem, the travelling wave problem, the problem related to uniform plane wave in lossy dielectric and problem associated with the telegrapher's equation. In essence, the proposed algorithm possesses complexity of order $O(n)$

This thesis reports the application of Haar wavelet algorithm in achieving the numerical solution of 2nd order computational electromagnetic problems related to dynamics of small, damped oscillations for compound pendulum based system.

For three different fractional order calculus-based electromagnetic wave computing problems, this thesis also offers a haar algorithm with phase-wise flow for comparative investigation. A comprehensive haar wavelet based method has also been developed for solving linear and non-linear Klein – Gordon equation ruling initial and boundary conditioned CEM problems.