

DECLARATION BY THE CANDIDATE

I, Lokendra Singh Umrao, certify that the work embodied in this thesis is my own bona fied work and carried out by me under the supervision of Dr. Ravi Shankar Singh from July 2012 to November 2015 at the Department of Computer Science and Engineering, Indian Institute of Technology, Varanasi. The matter embodied in this thesis has not been submitted for the award of any degree/diploma. I declare that I have faithfully acknowledged and given credits to the research workers wherever their works have been cited in my work in this thesis. I further declare that I have not willfully lifted up any other's work, paragraphs, text, data, results, *etc.*, reported in journals, books, magazines, reports dissertations, theses, *etc.*, or available at websites and included them in this thesis and cited as my own work.

Date : 06/11/2015

Place : Varanasi

LOKENDRA SINGH UMRAO

CERTIFICATE BY THE SUPERVISOR

It is certified that the above statement made by the student is correct to the best of my knowledge.

Dr. Ravi Shankar Singh
(Supervisor)

Dr. K. K. Shukla
(Professor and Head)
Department of Computer Science and Engineering