Detailed Biodata

1. Name: Dr. Varun Singh

2. Designation: Assistant Professor

3. Department: Civil Engineering

4. Institution: Motilal Nehru National Institute of Technology   Allahabad

4. Highest Qualification :   Ph.D.

5. Data of joining of institute: 22.05.2009

6. Email and mobile NO: varun@mnnit.ac.in, 9473956924

7. Institution's;Residence Address: Motilal Nehru National Institute of Technology Allahabad, Teliarganj Allahabad- 211004 (U.P.); C-66, Staff Colony, MNNIT Allahabad-211004

8. Date of Birth & Gender**:** 23-08-1977 and Male

9. Educational Qualifications:

(i) Ph.D. in the field of Intelligent Transportation Systems, Department of Civil Engineering, Indian Institute of Technology (IIT) Roorkee, India in year 2007.

(ii) M.Tech. in Civil Engineering with specialization in Computer Aided Design from Indian Institute of Technology (IIT) Roorkee, India in year 2002.

(iii) B.Tech. in Civil Engineering from Aligarh Muslim University, Aligarh, India in year 1999.

10. **Specialization:** Computer Aided Design, Geographic Information Systems

11. **Details of employment (past & present).**

Sl. No.	Period		Position Held	Organization	Nature of work	Nature of Appointment
	From	**To**				
1.	22-05-2009	Till date	Assistant Professor	MNNIT Allahabad	Teaching, Research Guidance, Consultancy and administrative	Regular
2.	14-12-2007	18-05-2009	Lecturer	BITS Pilani, Pilani	Teaching, Research Guidance, Consultancy and administrative	Regular
3.	08-06-2007	22-11-2007	Senior GIS Engineer	RMSI Ltd., Noida	Process Development and	Regular

12. RESEARCH

A. Details of Ph.D. Thesis Guidance

Sl. No.	Title of Ph.D. Thesis	Institute	Name of student[s]	Year	Status
1.	Development of GIS Based Framework for Agri-Food Supply Chain Network	MNNIT Allahabad	Mr. Vivek Purwar	2010	Ongoing
2.	Development of Framework for Spatial Decision Support System with Environmental Perspective	MNNIT Allahabad	Ms. Mamta Pandey	2010	Ongoing
3.	Assessment of transit network transportation performance	MNIT Bhopal	Mr. Ajay Pratap Singh	2011	Ongoing
4.	Multi-Dimensional Unified Spatial Algorithms	MNNIT Allahabad	Mr. Maharana Pratap Singh	2012	Ongoing
5.	Formalization and Modelling of Agent Based Geosimulation for Fire Emergency Response	MNNIT Allahabad	Mr. Mainak Bandyopadhyay	2012	Ongoing

B. Details of M.Tech. Thesis Guidance

Sl. No.	Title of Thesis	Institute	Name of student[s]	Year
1.	Path Planning using Voronoi Diagram and its application in GIS	MNNIT Allahabad	Mr. Vinay Verma	2014 (in Progress)
2.	Development of Real Time Heuristics Algorithm for Path Finding and its application in GIS	MNNIT Allahabad	Mr. Gaurav Kumar	2014 (in Progress)
3.	Municipal Solid Waste Management by GIS Technique	MNNIT Allahabad	Mr. Rohit Sahu	2014 (in Progress)
4.	GIS Based Optimal Siting Problem using Supply Chain Network	MNNIT Allahabad	Miss. Preeti Sharma	2013
5.	Data Modeling and Network Analysis for Supply Chain Network in Web-GIS Environment	MNNIT Allahabad	Mr. Satya Prakash Maurya	2013
6.	GIS Based Network Analysis Using Genetic Algorithm	MNNIT Allahabad	Mr. Dinesh Kumar Baghel	2013
7.	Multi-Modal Public Transport Information System	MNNIT Allahabad	Mr. Maharana Pratap Singh	2012
8.	A Framework for Emergency Management and Response System using GIS Technology	MNNIT Allahabad	Mr. Mainak Bandyopadhyay	2012
9.	Traffic Support Prototype: A Cogitation on Open Source Architecture	MNNIT Allahabad	Mr. Sarathy Anurag Abhay	2012
10.	GIS Based Traffic and Incident Information System	MNNIT Allahabad	Mr. Siddhartha Saxena	2010
11.	GIS Based Public Transit Information System	MNNIT Allahabad	Mr. Sarvjeet Pal	2010

C. ACADEMIC RESEARCH WORKS

i. Methodology for Advanced Traveller Information System (ATIS) for Developing Countries (Ph.D. Thesis)
This research work is focused towards the comprehensive methodological proposition and development of a **web GIS** based ATIS for storing and analysing the spatial (including associated attribute data) and temporal data and generating and disseminating the value-added multimodal traveller information under prevailing road and traffic conditions in metropolitan cities in developing countries. In brevity development methodology involves (i) selection of suitable system architecture and its modification in accordance to local needs (ii) collection of relevant data (iii) database design and implementation (iv) selection of software and hardware (iv) formulation of algorithms for carrying out detailed geo-spatial and network analysis and (v) subsequently developing a **web GIS** based system based on selected architecture for traveller information dissemination. Salient features of this research are:

   i. **Study of different system architectures and proposition of suitable system architecture design for ATIS.**
   ii. **Full-scale database development**: That involved (a) comprehensive data modeling (b) specific database design for RDBMS and (c) database implementation for spatial and non-spatial data involving georeferencing, digitization, data cleaning and data input.
   iii. **Formulation and Implementation of data management strategies:** That involved (a) Formulation of database management strategies using stored procedures and VBScript program and (b) Implementation of management strategies using scheduled task.
   iv. **Implementation of well known three-tier client server architecture-** in which presentation of information is independent of the processing rules and business logic, which in turn is separate from the database
   v. Formulation of data processing rules and business logic and their implementation using Active-X based business objects.
   vi. **Adoption of Prototype Development Strategy for development of system-** so that development of system has been carried out in iterative and incremental way i.e. starting with a simple implementation and iteratively enhancing the evolving sequence of versions until the full system is implemented.
   vii. Use of different types of functionalities available with GIS for information generation
   viii. **Use of Internet for information dissemination** – for wide spread information dissemination so that information is available to masses of people concurrently, without being burdened with complicated and expensive technology to access information.
   ix. System comprises of five basic modules, each one of them consisting of several different functionalities. These five modules are: (i) *Search* Module for dissemination of yellow pages information using multiple spatial and text based criteria about the Points of Interest (POI) (ii) *Traffic/Road Info* Module for dissemination of information about traffic stream and road side incidents, (iii) *Network Analysis* Module for dissemination of information based on network analysis, (iv) *Transit* Module for disseminating information about transit based on implementation of schedule based transit planning algorithm and (v) *Data Update* Module for authorised updating of traffic stream and incident data.

Software Used:

(a) **GIS**: GeoMedia Professional 5.1, GeoMedia WebMap Professional 5.1
(b) **Database**: SQL Server 2000
(c) **Other:** Internet Information Service 5.0, Visual Studio. NET 2003

Programming Languages Used:

VB.NET for data manipulation and transformation.

Scripting Languages in Used:

T-SQL, HTML, VBScript (for ASP implementation), JavaScript (for client-side functionalities)

ii. Rural Road Transportation Planning (M.Tech. Dissertation)

Development of Graphical User Interface (GUI) based software for accessibility planning of rural roads was carried out under Visual Studio 6.0 integrated development environment based on concept and framework of FBRNP (Facility Based Rural Road Network Planning) Model. Software has adequate number of functionalities for quick rural road network optimization and graphical display of the planned network with interactive data querying and digitization module similar to any GIS Software.

Software Used:

(a) **Programming Language:** Visual VC++
(a) **Database**: MS Access 2000
(b) **Other:** Visual Studio 6.0, Crystal Reports

Programming Language Used:

Visual Basic 6.0

iii. Computer Program for groundwater quality prediction (M.Tech. Minor Project)

Development of GUI based computer program for predicting the ground water quality was carried out in Java 1.3 language using swing objects. Subsequently program is tested for results by cross checking them using MATLAB 5.3.

Software Used:

MATLAB 5.3

Programming Language Used:

Java 1.3

iv. Soil Investigation and Foundation Design for a Nine Storeyed Shopping (B.Tech. Project)

In this project soil investigation and design of foundation is carried out for Nine Storeyed Shopping Complex. All important laboratory and field tests viz. Sieve Analysis, Hydrometer Analysis, S.P.T. Test, Plate Load Test etc. are carried out for determining the soil properties and then bearing capacity of soil. Subsequently design of foundation for the complex is carried using codal provisions of IS: 2950 (Code of Practice for Design and Construction of Raft Foundation) and IS: 456 (Code of Practice for Plain and Reinforced Concrete) Indian Standard Codes.
Software used: - Microsoft Excel-97, AutoCAD-Release13 for plotting and drawing

D.   PROFESSIONAL EXPERIENCE

i.   Process Development for acquisition of Spatial and Associated Attribute Data Irish Land Registry (ILR) at RMSI Noida
This project is focused towards the development of spatial database system based set of business rules for ILR project (www.**landregistry**.ie/). My responsibility involved the pilot testing and process refinement for the project.
Software Used: ArcGIS for Quality Control and AutoCAD
Database: Oracle 12g

ii.   Process Development for design and development of Spatial Database for Just In Time (JIT) Pizza Hut Inc. Supply Chain System at RMSI Noida
This project is focused towards the spatial database system for Pizza Hut Inc. My responsibility involved the process development for the project.

Software Used: Microsoft Access and MapInfo

13. PUBLICATIONS:

(A) INTERNATIONAL JOURNALS

(i) Pandey M., Singh V., Vaishya R.C. and Shukla, A.K., (2013)," Analysis & Application of GIS Based Air Quality Monitoring- State of Art", International Journal of Engineering Research & Technology (IJERT), Vol. 2 Issue 12, December – 2013, pp. 3788- 3796.

(ii) Bandyopadhyay , M., Singh, M.P. and Singh, V. (2012), "Spatial Pattern Analysis for finding Weighted Candidate Set for p-median Problem in Locating Emergency Facilities", International Journal of Advanced Research in Computer Science and Software Engineering (IJARCSSE), vol. 2, issue 5., pp. 69-74.

(iii) Singh, V. and Kumar, P. (2010), "Web Based Advanced Traveller Information System for Developing Countries", Journal of Transportation Engineering, American Society of Civil Engineers, vol. 136, Issue.9, pp. 836-845.

(iv) Kumar, P., Singh V. and Venkateshwar, A. (2009) "Intelligent Transport System for Developing Countries", World Review of Intermodal Transportation Research, Vol. 2, Nos. 2/3,pp. 201-217.

(v) Kumar, P., Singh V. and Reddy D. (2005)," Advanced Traveller Information System for Hyderabad City", IEEE Transactions on Intelligent Transportation Systems (ITS), vol. 6, no.1, pp. 26-37.

(B) NATIONAL JOURNALS

(i) Singh, V. and Kumar, P. (2012), "GIS Based Application of Advanced Traveler Information System in India", Journal of the Institution of Engineers (India): Series A, Volume 93, Number 1, pp. 79-85.

(ii) Singh, V. and Kumar, P. (2011), "Implementation of Data Tier in Advanced Traveller Information System (ATIS)", Indian Highways, Indian Road Congress, Vol 38, No.12, Dec 2010, pp. 33-46.

(iii) Kumar, P., Singh, V. and Venkateshwar, A. (2007), "Advanced Traveller Information System for Delhi Metropolitan City", Indian Highways, Indian Roads Congress, Vol. 35, No. 5, pp 39-49.

(iv) Kumar, P., Singh, V. and Satish Chandra (2003), Graphical Interface for Rural Road Accessibility Planning, Journal of Indian Roads Congress, vol. 64-1, pp. 133-159.

(C) CONFERENCES

(i) Bandyopadhyay M., Singh M.P. and Singh Varun (2013), Formalization and development of logic based Emergency Response Systems using Situation Calculus, IEEE International Conference on Machine Intelligence Research and Advancement, 21 Dec - 23 Dec, Jammu, India.

(ii) Bandyopadhyay M.,Singh M.P. and Singh Varun (2013), Optimizing the Emergency Response Activity Planning through GIS based Agent Based Modeling and Simulation Technique, International Conference on Challenges in Disaster Mitigation and Management, IIT Roorkee, Feb. 15-17.

(iii) Bandyopadhyay , M., Singh, M.P. and Singh, V. (2012),"Integrated visualization of distributed spatial databases", IEEE Conference on Recent Advances in Information Technology, ISM Dhanbad, March 15-17, vol. 2,ISBN No. 978-1-4577-0694-2.

(iv) Bandyopadhyay , M., Singh, M.P. Prakash, Satya and Singh, V. (2012), "Implementation of Emergency Management and Response System for Low Impact Incidences using GIS Technology", International Conference on Intelligent Infrastructure at the 47th Annual National

Convention Computer Society Of India CSI- 2012, Dec. 1-Dec. 2, ISI, Kolkata, ISBN: 978-1-25-906170-7 TMH Publication.

(v) Singh, V. and Kumar, P. (2008), "Advanced Traveller Information System for Developing Countries", 23rd Australian Road Research Board Conference (ARRB), Adelaide, Australia, July 30 - August 2, On CD ROM, ISBN No.1876592540.

(vi) Kumar, P. Singh V. and Suman S. (2008), "Traveller Information System for Mixed Traffic In India", International Conference on Best Practices to Relieve Congestion on Mixed-traffic Urban Streets in Developing Countries, IIT Madras, Sept.12-14.

(vii) Singh, V., Kumar, P. and Kotzinos, D. (2006), "A web GIS based Framework for Computerized Traveler Information and Decision Support System for Metropolitan Cities in India", 9th Map India International Conference on GIS, GPS, Aerial, Photography and Remote Sensing, New Delhi, India, Jan. 30- Feb. 1, 10 pp.

(viii) Kumar, P., Chandra, S., Singh, V., Singh, T. (2004), "A Software for Rural Road Accessibility Planning", Proc. International Conference on Transportation Systems Planning and Operation, IIT Madras, Chennai, India, Feb. 18-20, pp. 51-60.

(ix) Singh V., Singh, T., Langan, D. and Kumar, P. (2004), "A Framework for Internet GIS based Computerised Visitors Information System for Theme Parks", Proc. 7th International IEEE Conference on Intelligent Transportation Systems, Washington, D.C. USA, Oct. 3-6, pp. 679-683.

(x) Kumar, P., Singh V. and Reddy D. (2003), "GIS Based Advanced Traveler Information System for Hyderabad City", 6th International IEEE Conference on Intelligent Transportation Systems Shanghai, China, Oct. 12-16.

15. OTHER INFORMATION

(A) Research Areas of Interest

(i) Engineering Informatics

(ii) Geographic Information Systems (*Geo-computing, Spatio-temporal Analysis*, *Open-Source Web Computing*)

(iii) Intelligent Transportation Systems

(B) Computer Skills

Operating Systems: Window 98/XP, Windows 2000 Server

Programming Languages: C/C++, Visual Basic 6, Visual Basic. NET, Java 1.3

Scripting Languages: HTML, PHP, JavaScript, VBScript, SQL, ArcObjects

GIS Software: ArcGIS, GeoMedia Professional, GeoMedia WebMap Professional, MapInfo, ILWIS, POSTGIS

Database Software: Microsoft Access 2000, Microsoft SQL Server 2000, POSTGRESQL

Other Software: MATLAB, AutoCAD Civil 3D

(C) Professional recognition, awards, fellowships received

(i) MHRD Scholarship for pursuing M.Tech. at IIT Roorkee.

(ii) Institute Fellowship for pursuing Ph.D. at IIT Roorkee.

(iii) Member Institution of Engineers (India) (Membership No. M-1477212) and Indian Roads Congress (Membership No. 40228)

(iv) Subject Price for paper entitled "GIS Based Application of Advanced Traveler Information System in India", Series 'A' Journal of IEI, Vol. 93, Issue 1 at 28th Indian Engineering Congress, Chennai Dec. 20, 2013.

(D) Institute Funded Projects

(i) TEQIP Project Funding for B.Tech. Project entitled "**Shortest Path Analysis of the Transport Network Using Particle Swarm Optimization**" through office order no. 164/R&C/13-14, dated: 25-09-2013. Project is in progress. Funding Cost: Rs. 2,80,000.00.

(ii) TEQIP Project Funding for guidance for Ph.D. research work entitled "**Formalization, Modelling and GeoSimulation of Emergency Response of Fire Department of Allahabad City**" through office order no. 203/R&C/13-14, dated: 25-11-2013. Project is in progress. Funding Cost: Rs. 2,60,000.00.

14. Consultancy Works

Sl. No.	Details	Organisation	Amount [in Rs lakhs]	Co-Investigator[s], if any	Year
1.	GSB (Close Graded) Job Mix Formula and other aggregate testing,	Nirmaan Khand-I PWD Pratapgarh,	0.215	Prof. A.K. Singh	2009-10
2.	Bitumen Testing C.A.T.C. Bumrauli, Allahabad	Air Ports Authority of India	0.0717	Prof. A.K. Singh	2010-11
3.	SDBC-25 and BM-50 Mix Design, National Highway, Division I PWD, Allahabad	National Highway, Division I PWD, Allahabad	0.44120	Prof. A.K. Singh	2010-11
4.	SDBC-25 Job Mix, PWD Banda	PWD Banda	0.2206	Prof. A.K. Singh	2010-11
5.	Soil Testing, Surveying for construction of road, boundary wall and culvert at IFFCO Phulpur	IFFCO Phulpur	6.61	Prof. S.K. Duggal, Prof. R.P. Tiwari, Prof. A.K. Sachan and Dr.	2012-13

				N. Rawal	
6.	Job Mix Design	Nirman Khand-1, PWD Allahabad	0.66180	Dr. Shalinee Shukla	2012-13
7.	Job Mix Design	National Highway Phase-I, PWD Allahabad	0.49635	Dr. Shalinee Shukla	2012-13
8.	Job Mix Design	National Highway Phase-I, PWD Allahabad	0.69489	Dr. Shalinee Shukla	2012-13
9.	Job Mix Design	Nirman Khand-4, Khumbh Mela, PWD Allahabad	0.63974	Dr. Shalinee Shukla	2012-13
10.	Investigation of approach road of cable stayed bridge Naini Allahabad	NHAI	2.16	Prof. A.K. Singh	2012-13
11.	Third Party Inspection of roads Kumbh Mela	Various Agencies	--	Prof. R.P. Tiwari, Dr. P.R. Pal, Dr. Shalinee Shukla	2012-13
12.	Job Mix Design	PWD Allahabad	0.55618	Dr. Shalinee Shukla	2912-13
Total		12.76746			

15. Administrative Works

Period	Organisation	Nature of Responsibility	Designation
From April 2008 to April, 2009	Instruction Division, BITS Pilani	Maintenance of Computerized Time Table Software	Automation Incharge

From July, 2009 to April, 2009	Civil Engg. Dept., BITS Pilani	Maintenance and Supervision and Consultancy works	O.C. Transportation Engineering Laboratory
From March, 2010 to May 2011	Civil Engg. Dept., MNNIT Allahabad	Assessing and improving requirements of equipments and other purchase at Laboratory	Member, Civil Department Purchase Committee
From March, 2010 to till date	Civil Engg. Dept., MNNIT Allahabad	Ph.D. and M.Tech. Students Selection Committee	Member
From March 2010 to till date	Civil Engg. Dept., MNNIT Allahabad	Assessing and improving requirements of equipments and other purchase at Laboratory	O.C. CAD Laboratory
From Oct. 2011 to Oct. 2013	GIS Cell, MNNIT Allahabad	Assessing and improving requirements of equipments and other purchase at Laboratory	O.C. GIS and Remote Sensing Laboratory
From July 2013 till date	GIS Cell, MNNIT Allahabad	Academic Works Related to Masters Programme	DMPC Convener, GIS Cell

16. Teaching Experience

[a] Details of Theory Course[s] taught at UG level:

Sl. No.	Name of the Course	Contact hours engaged per week	Institution	Level
1.	CE 708, Computer Aided Design (Elective)	4 (3 Lectures and 1 Tutorial)	MNNIT Allahabad	U.G.
2.	CE-402, Computer Based Numerical Techniques	4 (3 Lectures and 1 Tutorial)	MNNIT Allahabad	U.G.
3.	CE 602, Transportation Engineering II	4 (3 Lectures and 1 Tutorial)	MNNIT Allahabad	U.G.
4.	CE 502, Transportation Engineering I	6 (5 Lectures and 1 Tutorial)	MNNIT Allahabad	U.G.
5.	CE 403, Geoinformatics	4 (3 Lectures and 1 Tutorial	MNNIT Allahabad	U.G.
6.	CE-711, Fundamentals of GIS and GPS	4 (3 Lectures and 1 Tutorial)	MNNIT Allahabad	U.G.

SI. No.				
7.	CE 401, Computer Based Numerical Techniques	5 (3 Lectures and 2 Tutorials)	MNNIT Allahabad	U.G.
8.	CE 501 Construction Planning and Management at MNNIT Allahabad	5 (3 Lectures and 2 Tutorials)	MNNIT Allahabad	U.G.
9.	CE C416, Computer Applications in Civil Engineering	4 (3 Lectures and 1 Tutorial)	BITS Pilani	U.G.

[b] Details of Theory Course[s] taught at PG level

SI. No.	Name of the Course	Contact hours engaged per week	Institution	Level
1.	CE-352, Principles of Remote Sensing	4 (3 Lectures and 1 Tutorial)	MNNIT Allahabad	P.G.
2.	CE-360, Fundamentals of GPS	4 (3 Lectures and 1 Tutorial)	MNNIT Allahabad	P.G.
3.	CE 351, GIS Technology	4 (3 Lectures and 1 Tutorial	MNNIT Allahabad	P.G.
4.	CE-353 Satellite Image Processing	2 (Lectures)	MNNIT Allahabad	P.G.
5.	CE 361 Web GIS	1 (Lectures)	MNNIT Allahabad	P.G.
6.	CE G610, CADD in Civil Engineering	4 (3 Lectures and 1 Tutorial)	BITS Pilani	P.G.

[c] Details of Practical classe[s] engaged:

SI. No.	Name of the Course	Contact hours engaged per week	Institution	Level
1.	CE-501, Transportation Engineering I	4	MNNIT Allahabad	U.G.
2.	MA 101/MA 201, Engineering Graphics	4	MNNIT Allahabad	U.G.
3.	CE-604 Computer Aided Design	4	MNNIT Allahabad	U.G.
4.	CE-353 Satellite Image Processing	4	MNNIT Allahabad	P.G.
5.	TA C111, Engineering Graphics	4 (3 Lectures and 1 Tutorial)	BITS Pilani	U.G.
6.	CE-403 Geoinformatics	4	MNNIT Allahabad	U.G.