Curriculum Vitae

Rajat Verma

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▪ Program Sought

Ph.D. in Civil Engineering (Transportation Systems)

▪ Areas of Interests

Intelligent Transportation Systems (ITS), Data Analytics in Transportation, Network Modeling.

▪ Educational Background

2017 – Present	**Master of Science**, Michigan State University. Major in **Civil Engineering** with Graduate Certificate in Computational Modeling. Current GPA: 4.0 out of 4.0. Graduation expected: May 2019.
2013 – 2017	**Bachelor of Technology** (B.S. equivalent), Indian Institute of Technology (IIT) Roorkee, India. Major in Civil Engineering. GPA: 8.636 out of 10.
2011 – 2013	**High School** (12th Grade), Silver Bells High School, Gwalior, Madhya Pradesh, India. Score: 91.4%, with 100% in Mathematics.
2009 – 2011	**Secondary School** (10th Grade), Gwalior Glory High School, Gwalior, Madhya Pradesh, India. GPA: 10.0 out of 10.0.

▪ Work Experience

Aug 2017 – ongoing	**Graduate Research Assistant**, Michigan State University. Advisor: Dr. Timothy Gates. Worked/working in these projects:
	▪ Effect of speed limit change on operating speeds in Michigan.
	▪ NCHRP project 17-76: Guidance for the setting of speed limits.
	▪ Safe Routes to School (SR2S) FY 2017.
May – Jun 2016	**Research Intern**, Indian Institute of Science, Bengaluru, India. Supervisor: Dr. Ashish Verma.
	▪ Worked on the sub-project "*Spatial Analysis of Pedestrian Crowds*" of the main project "*The Kumbh Mela Experiment: Measuring and Understanding the Dynamics of Mankind's Largest Crowd*", Ujjain, India.
	▪ Studied pedestrian traffic flow theory and the social force method to study the basic forms of interaction among pedestrian groups.
	▪ Developed geometric formations of pedestrian groups under different conditions of traffic density and analyzed group recovery using MATLAB.
Dec 2015	**Web Developer**, Flicksup, Bengaluru, India.
	▪ Designed and developed website user interface of a startup service using jQuery.
	▪ Flicksup selected for FbStart program after website launch.

▪ Publications and Conference Papers

1. Verma, R., Saedi, R., Zockaie, A., Gates, T.J., *"Behavioral Analysis of Drivers Following Winter Maintenance Trucks Enabled with a Collision Avoidance System"*.

   - Under review for publication: Transportation Research Record.
   - Accepted for presentation: Transportation Research Board Annual Meeting 2019.

2. Saedi, R., Verma, R., Zockaie, A., Ghamami, M., Gates, T.J., *"Network-wide Emission Estimation by Incorporating Network Fundamental Diagram"*.

   - Abstract published: Journal of Transport & Health 9:S54-S55. DOI: 10.1016/j.jth.2018.05.041.
   - Poster presentation: International Conference on Transport and Health 2018, MI.
   - Submitted (9/1/2018): Transportation Research Part C: Emerging Technologies.

3. Paul, M., Verma, R., Ghosh, I., *"An Efficient Calibration of Microsimulation Model for Signalized Intersections under Heterogeneous and Undisciplined Traffic"*.

   - Accepted for presentation: Transportation Research Board Annual Meeting 2019.
   - Submitted: World Conference on Transportation Research (WCTR 2019), Mumbai, India.

▪ Relevant Projects

Graduate Level

Aug 2018 – ongoing	**Effect of Speed Limit Change in Michigan on Operational Speeds**. ■ Analysis of speed data before and after the speed limit increase in Michigan in 2017 from permanent traffic recorders, lidar gun survey, and video speed review. ■ Concluded that increase of speed limit by 5 mph increased operational speed by about 2 mph on non-freeway highways; awaiting more data.
Jan – Apr 2018	**Performance Analysis of FlexRoute23**. ■ Simulated a managed lane traffic corridor on US-23 in Michigan in PTV Vissim. ■ Preliminary performance analysis showed the effectiveness of hard shoulder running in reducing peak hour congestion is meager in the short-term.

Undergraduate Level

Jul 2016 – Apr 2017	B.S. Senior Year Project. Design of sustainable urban drainage and rainwater harvesting systems for IIT Roorkee campus.
Feb – Apr 2016	B.S. Junior Year Project. Origin-destination based traffic congestion modeling on a bus route in Delhi.
May – Jun 2015	The effect of green signal countdown timer on dilemma zone of signalized intersections, with Dr. Indrajit Ghosh.
Jan – Apr 2016	Preparation of a thematic map of IIT Roorkee using GIS.
Jan – Apr 2015	Optimized cross-sectional design of flexural member for cost minimization.

Independent Projects

November 2018	Kakuro Solver in Python using System of Simultaneous Equations (GitHub).

▪ Relevant Course Work

Graduate Level

- *CE841* Traffic Flow Theory
- *CE849* Statistics in Transportation
- *CMSE801* Introduction to Computational Modeling

- *CE850* Intelligent Transportation Systems
- *CE851* Transportation and Environment
- *ECE801-602* Data Science: Concepts, Techniques, and Practice

Undergraduate Level

- Numerical Methods and Programming
- Linear Algebra, Statistics and Probability
- *CE448* Transportation Planning
- Traffic Road Safety
- Railway Engineering and Airport Planning
- Highway Pavement Engineering
- Highway Geometric Design
- Theory and Applications of GIS

Coursera

- Introduction to Graph Theory, *University of California San Diego*.
- Bayesian Statistics, *University of California Santa Cruz*.

▪ Participation and Achievements

2018	Best Poster in Civil Engineering (Transportation/Pavements), 2018 **Engineering Graduate Research Symposium**, Michigan State University.
2018	Part of winning team, **ITE Trivia Quiz** on traffic safety and management, Institute of Traffic Engineers Greater Lansing Chapter, MI.
2017	Participated in **Microsoft Hackathon** 2017, IIT Roorkee, India.
	▪ Developed in one day a web scraper that collects country-level tabular statistics from Wikipedia pages and converts them to interactive choropleth maps.
2014 – 2016	**Merit-cum-means Scholarship**, IIT Roorkee, India.
	▪ Received INR 100,000 (≈$1500) in scholarship for two consecutive years based on excellent academic performance and financial need.
2013	**Joint Entrance Examination**, India.
	▪ Scored 98.84 percentile in Paper I (Mains) out of about 1.4 million candidates.
	▪ Secured national rank 2533 from a total of about 150,000 students in Paper II (JEE Advanced), one of the most competitive college entrance exams in the world.
2009	National rank 23, Indian National Cartographic Association **(INCA) Map Quiz.**

▪ Skills

Category	Skill	Level	Skill	Level
Programming and Web Development	Python	●●●●●	HTML	●●●○○
	R	●●●●◐	CSS	●●●●○
	MATLAB	●●●●◐	JavaScript	●●●◐○
	SQL	●●●○○	jQuery	●●●●○
	C++	●●○○○	VBA	●◐○○○
Software Packages	Tableau	●●●●◐	PTV Vissim	●●●○○
	QGIS	●●●◐○	Adobe Photoshop	●●●●◐
	IBM SPSS	●●○○○	Adobe Illustrator	●●●●●
	MS Excel	●●●●◐	Autodesk AutoCAD	●●●○○
Languages	English	●●●●◐		
	Hindi (native)	●●●●◐		
	Italian	●○○○○		

▪ Extra-Curricular Activities

Groups and Communities

2018 – now	Member, **American Society of Civil Engineers** (ASCE).
2018 – now	Member, **Graduate Employees Union** (GEU), Michigan State University.
2017 – now	Member, **Institute of Traffic Engineers** (ITE).
	▪ Participated in ITE Student Leadership Summit 2017, Purdue University.
2016	**Recruitment Representative**, Department of Civil Engineering, IIT Roorkee.
	▪ Coordinated management of senior-year job recruitment.
2015 – 2016	**Creativity and Design Coordinator**, Information Management Group (IMG), IIT Roorkee.
	▪ IMG organizes the official website and intranet web-app portal of IIT Roorkee.
	▪ Conducted lectures on innovations in web design and organizational structures.
2013 – 2016	**Joint Secretary**, Design section, Kshitij – The Literary Magazine, IIT Roorkee.
	▪ Supervised the graphic design of the magazine in coordination with different team sections, besides conducting design-oriented events.

Community Service

2013	Member, **National Service Scheme**, IIT Roorkee.
	▪ Participated in cleanliness and electricity conservation drives, food waste prevention program, and promotion of handcrafted recycled paper bags.
	▪ Helped conduct blood donation drives; regular donor since 2015.
2013	Volunteer, **CRY Roorkee Chapter**, IIT Roorkee.
	▪ Child Rights and You (CRY) is a philanthropic organization that focuses on individual level mentoring of unprivileged children in India.

▪ References

Dr. Timothy J. Gates
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