Mayank Suman

🛈 Male, Indian, DoB: 23rd April 1991

✉ mayanksuman@protonmail.com   mail@mayanksuman.in

🆔 https://orcid.org/0000-0002-1402-8982

💻 https://github.com/mayanksuman

🌐 https://mayanksuman.in/

Education

2015 – 2021	🎓 **Doctor of Philosophy (Ph D), Indian Institute of Technology Kharagpur, India**. Department: School of Water Resources. Thesis Title: *Analysis and Modeling of Climate Change Impact on Hydrological Extreme Events across India*. Supervisor: **Prof. Rajib Maity**, Department of Civil Engineering, IIT Kharagpur.
2013 – 2015	🎓 **Master of Technology (M Tech), Indian Institute of Technology Kharagpur, India**. Department: Civil Engineering. Thesis Title: *Hybrid Wavelet-Auto-Regressive model with exogenous inputs (Wavelet-ARX) for modelling hydro-meteorological associations at river basin scale*. Supervisor: **Prof. Rajib Maity**, Department of Civil Engineering, IIT Kharagpur.
2009 – 2013	🎓 **Bachelor of Technology (B Tech), National Institute of Technology Hamirpur, India** in Civil Engineering.

Work Experience

Mar, 2022 –	🔖 Assistant Professor, Department of Civil and Infrastructure Engineering, IIT Jodhpur, India.
Sep, 2021 – Feb, 2022	🔖 Postdoctoral Research Fellow, Institute of Environmental and Energy Technology, POSTECH, South Korea.
Jan, 2021 – Jul, 2021	🔖 Research Associate, Department of Civil Engineering, IIT Kharagpur, India.

Research Publications

Journal Articles

1. **Suman**, **Mayank** and Rajib Maity (2021). 'Assessment of Basin-wise Future Agricultural Drought Status across India under Changing Climate'. *Journal of Water and Climate Change*. ISSN: 2040-2244. DOI: 10.2166/wcc.2021.369.

2. **Suman**, **Mayank**, Rajib Maity and Harald Kunstmann (2021). 'Precipitation of Mainland India: Copula-based Bias-corrected Daily CORDEX Climate Data for both Mean and Extreme Values'. *Geoscience Data Journal*, pp. 1–17. DOI: 10.1002/gdj3.118.

3. **Suman**, **Mayank** and Rajib Maity (2020). 'Southward shift of precipitation extremes over south Asia: Evidences from CORDEX data'. *Scientific Reports* 10.1, pp. 1–11. DOI: 10.1038/s41598-020-63571-x.

(4) Maity, Rajib, **Mayank Suman**, Patrick Laux and Harald Kunstmann (2019). 'Bias Correction of Zero-Inflated RCM Precipitation Fields: A Copula-Based Scheme for Both Mean and Extreme Conditions'. *Journal of Hydrometeorology* 20.4, pp. 595–611. DOI: 10.1175/JHM-D-18-0126.1.

(5) **Suman**, **Mayank** and Rajib Maity (2019). 'Assessment of Streamflow Variability with Upgraded HydroClimatic Conceptual Streamflow Model'. *Water Resources Management* 33.4, pp. 1367–1382. DOI: 10.1007/s11269-019-2185-8.

(6) **Suman**, **Mayank** and Rajib Maity (2019). 'Hybrid Wavelet-ARX approach for modeling association between rainfall and meteorological forcings at river basin scale'. *Journal of Hydrology* 577, p. 123918. DOI: 10.1016/j.jhydrol.2019.123918.

(7) Pal, Manali, Rajib Maity, **Mayank Suman**, Sarit Kumar Das, Parul Patel and Hari Shanker Srivastava (2017). 'Satellite-Based Probabilistic Assessment of Soil Moisture Using C-Band Quad-Polarized RISAT1 Data'. *IEEE Transactions on Geoscience and Remote Sensing* 55.3, pp. 1351–1362. DOI: 10.1109/TGRS.2016.2623378.

(8) Maity, Rajib, **Mayank Suman** and Nitesh Kumar Verma (2016). 'Drought prediction using a wavelet based approach to model the temporal consequences of different types of droughts'. *Journal of Hydrology* 539, pp. 417–428. DOI: 10.1016/j.jhydrol.2016.05.042.

Conference Proceedings

(1) **Suman**, **Mayank** and Rajib Maity (Apr. 2021). 'Future Changes in extreme precipitation over South Asia and its causes'. *EGU General Assembly Conference Abstracts*. Vol. 23. Vienna, Austria.

(2) **Suman**, **Mayank** and Rajib Maity (May 2020). 'Modeling of Basin Scale Hydro-meteorological association by Hybrid Wavelet-ARX approach'. *EGU General Assembly Conference Abstracts*. Vol. 22. Vienna, Austria.

(3) Maity, Rajib, **Mayank Suman**, Patrick Laux and Harald Kunstmann (Sept. 2019). 'Copula-based Bias correction scheme for zero-inflated RCM precipitation fields'. *Water Future Conference 2019*. Bangalore, India.

(4) Pal, Manali, **Mayank Suman**, Sarit Kumar Das and Rajib Maity (Apr. 2017). 'Probabilistic Assessment of Soil Moisture using C-band Quad-polarized Remote Sensing Data from RISAT1'. *EGU General Assembly Conference Abstracts*. Vol. 19. Vienna, Austria, p. 14907.

(5) **Suman**, **Mayank** and Rajib Maity (Dec. 2016). 'Foreseeing the Agricultural and Hydrological Drought Knowing the Ongoing Meteorological Scenarios through Wavelet Analysis'. *Proceedings of the International Conference on Hydraulics, Water Resources, Coastal & Environmental Engineering*. Citations: 2. The Indian Society for Hydraulics. Pune, India.

(6) Ray, Sanjay Kumar, Amit Kumar, **Mayank Suman** and V. R. Desai (Oct. 2014). 'Comparison of Effective Drought Index (EDI) and Standardized Precipitation Index (SPI) : A case study for Shivrinarayan Region of Mahanadi Basin'. *Invited Paper in National Workshop on Recent Advances in Civil Engineering (RACE)*. Burla, Odisha, India.

(7) Bansal, Vijay Kumar and **Mayank Suman** (Dec. 2013). 'Estimation of runoff and soil erosion using GIS: a case study of NIT Hamirpur campus'. *Proceedings of the Fortieth National Conference on Fluid Mechanics and Fluid Power*. Hamirpur, H.P., India.

Books Chapters

1 Maity, Rajib and **Mayank Suman** (2019). 'Predictability of Hydrological Systems Using the Wavelet Transformation: Application to Drought Prediction'. In: *Hydrology in a Changing World*. Citations: 4. Springer, pp. 109–137. DOI: 10.1007/978-3-030-02197-9_5.

Dataset

1 **Suman**, **Mayank**, Rajib Maity and Harald Kunstmann (2019). *Bias Corrected daily most expected and extreme CORDEX precipitation data set for India*. figshare. DOI: 10.6084/m9.figshare.9686648.v2.

Contribution to Research Grants/Projects

2015 – 2018 — **Modelling of soil moisture in a changing climate using the potential of probabilistic hydrometeorological approach**, sponsored by MoES, GOI, under the guidance of Prof. Rajib Maity, IIT Kharagpur.

2015 — **Probabilistic Estimation of Soil Moisture from RISAT1 Data along with Uncertainty Quantification**, sponsored by Space Application Centrev(SAC), ISRO, under the guidance of Prof. Rajib Maity, IIT Kharagpur.

2014 — Worked in a team on **Comparison of Effective Drought Index And Standard Precipitation Index : A Case Study For Shivrinarayan Region In Mahanadi Basin** under the guidance of Prof. V. R. Desai, IIT Kharagpur.

2012 – 2013 — **Runoff and Soil Erosion Estimation of NIT Hamirpur using Soil Conservation Service Runoff Curve Number (SCS-CN) and Revised Universal Soil Loss Equation (RUSLE) model respectively**, and **Building Information Modeling of ECE Building, NITH and its GIS Data Interoperability** under the guidance of Prof. Vijay Kumar Bansal, NIT Hamirpur.

2011 — Worked in a team on **Software modeling of Flow inside Pipes by using Navier-Strokes Equation** under the guidance of Prof. R. L. Sharma, NIT Hamirpur.

— Worked in a team on **Estimation of soil erosion by RUSLE model for Hamirpur city** under the guidance of Prof. Chandra Prakash, NIT Hamirpur.

Awards/Recognition & Publicity

2020 — Research work regarding future change in monsoon featured in **digital** and **print media** (**Nature India**, **Hindustan Times**, **IIT KGP Chronicles**, **IIT KGP News**, **Anand Bazar Patrika** and others).

2018 – 2020
2013 – 2015 — **Ministry of Human Resources Development (MHRD) Scholarship** for Ph.D. and M.Tech studies at IIT Kharagpur, India.

2012 – 2013 — Recognition and prizes in **Civil Engineering design competitions** (Arch-Casting, Transmission Tower, and Hospital design).

2005 – 2008 — School and regional topper for **National Science Olympiad** in class 9th-12th.

Teaching Experience

Undergraduate

2020, 2015	⌨ **Teaching Assistant** in Statistical Methods in Hydrology, Course Instructor: Prof. Rajib Maity (4 Credits; 2 Semesters).
2017	⌨ **Teaching Assistant** in NPTEL online certification course on Probability Methods in Civil Engineering, Course Instructor: Prof. Rajib Maity (1 Semester).
2015	⌨ **Teaching Assistant** in Water Resources Engineering Laboratory, Course Instructor: Prof. Rajib Maity (3 Credit; 1 Semester).
2014 – 2019	⌨ **Teaching Assistant** in Engineering Drawing and Computer Graphics, Course Instructors: Prof. Rajib Maity, Prof. V. R. Desai, Prof. Bhabagrahi Sahoo, Prof. Renji Rameshan, Prof. M.K. Tiwari and others (4 Credits; 5 Semesters).

Graduate

2015	⌨ **Teaching Assistant** in Applied Hydrology, Course Instructor: Prof. Rajib Maity (4 Credits; 1 Semester).

Open Peer Courses

2018 – 2019	⌨ Have taken courses on Time Series Analysis, Copula Theory and Computer Programming using MATLAB and Python for my labmates.

Talks/Presentations/Workshops

14 May, 2022	▦ 42nd SOA Weekly Academic Invited Lecture on 'Geographically Distinct Changes in Extreme Hydrological Events Over India Due to Changing Climate'.
2013	▦ **NIT Hamirpur:** Organized workshop on LaTeX for undergraduate and graduate students.
2011	▦ **IIT Roorkee:** Earthquake Resistant Construction Practices.
	▦ **NIMBUS, NIT Hamirpur:** Co-organized workshop on STAAD Pro.

Short Term Courses/Seminars

2015	▮ Attended short-term course on Hydrologic Design in a Changing Climate offered by IIT Kharagpur (30-31 May).
	▮ Student volunteer for organizing team of Soil and Water Networking National Workshop, IIT Kharagpur (5-7 January).
2014	▮ Attended International Summer & Winter Course on Modelling in Fluvial Processes offered by IIT Kharagpur (9-20 June).

Reviewer

2017 – 2020	▤ Journal of Earth System Science, Springer Nature.
	▤ ISH Journal of Hydraulic Engineering, Taylor & Francis.

Mentorship Role/Academic Assistance

2015 – 2018   👤 Bhagarathi Sahu (MTech Student), P Jaswanth Reddy (BTech Student), Vishal Babu (BTech Student).

Skills and Certifications

Computational Skills

Programming	💻	C\C++, Python, R, Lua, MATLAB, FORTRAN, Julia, BASH, NCL, Java, LaTeX, Visual Basic.NET, C#.NET, and others.
OS Admin.	💻	UNIX (Linux, MacOS, Solaris, BSDs), Windows.
HPC/Cluster Admin.	💻	Ansible, Lmod, Spack, Kubernetes (K3s and K0s).
Databases	💻	MySQL, MariaDB, SQLite.
Web Tech.	💻	PHP, DHTML, Django, Apache & Nginx Web Servers, WordPress.
EduTech	💻	Moodle, BigBlueButton, Manim.
Multimedia Design	💻	Gimp, Inkscape, Darktable, Blender, OBS Studio, Adobe Creative Suite.
Other Softwares	💻	ArcGIS, QGIS, STAAD, Autodesk Revit, AutoCAD, Geo 5, GeoStudio, Ansys (Fluent).
Open Source Dev.	💻	Regular contributor to multiple open source projects like Libreoffice, Projecteur and others.

Communication Skill

Languages	💻	Reading, writing and speaking competencies in Hindi and English.

Certifications

2021   💻 **freeCodeCamp**: Multiple certifications for python programming:

- 🔖 **Scientific Computing with Python**.
- 🔖 **Data Analysis with Python**.

2020   💻 **Coursera**: Completed multiple machine learning courses:

- 🔖 **Neural Networks and Deep Learning** [Certificate # *6SD2T9M6XVXG*].
- 🔖 **Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization** [Certificate # *88UUPMLTD32N*].
- 🔖 **Structuring Machine Learning Projects** [Certificate # *MK72KAP2TL5Q*].

💻 **ESRI**: Spatial Analysis (GIS) course **Going Places with Spatial Analysis** [Certificate # *5f3f6929b560110b983add74*].

Extra-Curricular Activities

2020   🔖 Arctic Code Vault Contributor for 2020 Github Code Archive Program.

Extra-Curricular Activities (continued)

2018	🔖 Awarded 1st Dan Black Belt (Shodan) in Kyukyoshin-kan Karate from Kyokyushin-Kan International Honubu, Japan.
2014	🔖 Organised a mathematical problem solving event 'ENCODE' in MEGALITH 2014.
2011	🔖 Executive Member of CIVIL Team 'CIVICTRUS' of NIT Hamirpur Annual Technical Festival 'NIMBUS'.
2011 – 2012	🔖 Organised and Programmed Network driven quizzes 'DARCODE' and 'QUIZOTICA' for 'CIVICTRUS' team.
2010 – 2013	🔖 Member of LITERACY MISSION, a social service by students (now a GOI initiative) to educate under-privileged children living in and around NIT Hamirpur campus and have taught children regularly (six days a week).
	🔖 Member of organizing team and Chief Digital Designer of PRAYAS, annual charity show of LITERACY MISSION, NIT Hamirpur.
	🔖 Managed the website of LITERACY MISSION, NIT Hamirpur.
	🔖 Have made theme videos for Institute Events (like Annual Alumni Meet, Orientation Day etc.) in NIT Hamirpur.
2009 – 2013	🔖 Student Member of ISTE (Indian Student for Technical Education) NIT Hamirpur Local Chapter.

References

Dr. Rajib Maity (Ph D Supervisor)
Professor, Department of Civil Engineering,
Indian Institute of Technology Kharagpur,
Kharagpur–721302, W.B., India.
✉ rajib@civil.iitkgp.ac.in

Dr. V. R. Desai
Professor, Department of Civil Engineering,
Indian Institute of Technology Kharagpur,
Kharagpur–721302, W.B., India.
✉ venkapd@civil.iitkgp.ac.in

Dr. Chandranath Chatterjee
Professor, Department of Agricultural and
Food Engineering,
Indian Institute of Technology Kharagpur,
Kharagpur–721302, W.B., India.
✉ cchatterjee@agfe.iitkgp.ac.in

Dr. Bhabagrahi Sahoo
Professor, School of Water Resources,
Indian Institute of Technology Kharagpur,
Kharagpur–721302, W.B., India.
✉ bsahoo@swr.iitkgp.ac.in