









Mayank Suman

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Education

- 2015 – 2021  **Doctor of Philosophy (Ph D), Indian Institute of Technology Kharagpur, India**
 Department: School of Water Resources
 (Date of Viva-Voce Exam: 4th January, 2021)
 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 [CGPA 9.21/10]
 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 [CGPA 8.11/10]

Work Experience

Jan, 2021 –  Research Associate, Department of Civil Engineering, IIT Kharagpur

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*. 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* 00, 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.jhydro1.2019.123918.
- 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.jhydro1.2016.05.042.

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

Teaching Experience (continued)




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

- 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

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|-------------------|--|
| 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 |
| Databases |  MySQL, MariaDB, SQLite. |
| Web Tech. |  HTML, CSS, JavaScript, PHP, Apache Web Server, Nginx Web Server, Moodle, BigBlueButton, WordPress, Django. |
| Multimedia Design |  GIMP, Inkscape, Darktable, Blender, Adobe Creative Suite. |
| Other Softwares |  ArcGIS, QGIS, STAAD, Autodesk Revit, AutoCAD, Geo 5, GeoStudio, Ansys (Fluent). |


Skills and Certifications (continued)

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 certification 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.
- 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.

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Dr. V. R. Desai

Professor, Department of Civil Engineering,
Indian Institute of Technology Kharagpur,
Kharagpur-721302, W.B., India.

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Dr. Chandranath Chatterjee

Professor, Department of Agricultural and
Food Engineering,
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Dr. Bhabagrahi Sahoo

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