Venkata Sai Krishna Vanama

Doctoral student, Urban Science Engineering

206-MRSLab, CSRE,
Indian Institute of Technology Bombay, Mumbai, INDIA
✆ (+91) 72-0713-8828 |✉ vsaikrishna1990@gmail.com | vsaikrishna1990
Web: https://sites.google.com/view/venkata-sai-krishna

Profile

Actively involved in various applications of Remote Sensing (RS) and Geographic Information system (GIS) in urban planning aspects, especially urban flood management and urban expansion monitoring. I have demonstrated cloud computing platforms' effectiveness to utilize the operational Sentinel-1 Synthetic Aperture Radar (SAR) datasets for operational flood mapping at varying spatial scales. Publications of this work and its advocacy have become seminal in the pursuit of flood monitoring with evident interest among remote sensing communities and application-based business enterprises. I have devised innovative radar flood indices utilizing advanced polarimetric scattering models for distinct acquisition modes. These indices are assessed against different flood events characterized by heterogeneous built-forms in serval regions around the globe. This technique is successfully implemented as processing pipelines in the cloud computing platforms (i.e., Google Earth Engine (GEE) and European Space Agency (ESA) RSS CloudToolbox Service) to leverage the high volume of operational SAR data delivered by the present and upcoming SAR missions.

My career objective is to obtain a researcher position wherein I can associate with the leading scientific group of dedicated people to expand my scientific and technical skills. I aspired to work in a challenging environment to achieve my career goals with hard work, intelligence where I can utilize my skills and abilities to the fullest.

Current Affiliation

Research Associate — Jan 2016 - Present
Centre for Urban Science and Engineering,
Indian Institute of Technology Bombay, Powai,
Mumbai – 400076, India.
E-mail: saiiitb@iitb.ac.in;
Tel (Office): 022-2576 4654

Education

Indian Institute of Technology Bombay, Mumbai, India — Jan. 2016 - Present
Doctor of Philosophy

- Thesis title: *Rapid mapping of flood areas in heterogeneous built-forms using multi-frequency SAR data*.
- Advisors: Prof. Y. S. Rao
- CPI: 8.5/10.0

Indian Institute of Remote Sensing (IIRS), ISRO and Andhra University (AU), India — Aug 2012 - Aug 2014
Master of Technology in Remote Sensing \& GIS with specialization in Human Settlement Analysis

- Thesis title: *Web based water utility management using geospatial techniques: A case study of Dehradun city, India.*
- Advisor: Mr. B. D. Bharath and Mr. Kamal Pandey

- CPI: 8.08/10.0

Jawaharlal Nehru Architecture and Fine Arts University (JNAFAU), Hyderabad, India Jun 2008 - Jun 2012

Bachelor of Technology in Planning

- Thesis title: Application of GIS techniques in urban solid waste management - A case study of Ongole town, A.P, India.
- Advisor: Ms. Tuhina Sinha
- CPI: 6.78 /10.

Sri Chaitanya Junior Kalasala, Andhra Pradesh, India Apr 2006 - Apr 2008

- Higher secondary (10+2) Science
- Marks: 93.6%

D R R M Municipal High School, Andhra Pradesh, India Mar 2006

- Secondary (10th)
- Marks: 90.66%

Experience

Microwave Remote Sensing Lab | Indian Institute of Technology Bombay, Mumbai, India Jan 2016 - Present

Research scholar

- SAR polarimetry and flood mapping application.
- Proposed automatic processing chain for monitoring flood dynamics.
- Urban expansion mapping with multi-temporal Earth Observation (EO) datasets.

Centre for Urban Science and Engineering | Indian Institute of Technology Bombay, Mumbai, India Jan 2016 - Present

Teaching assistant

- Courses involvement: GNR602: Advanced Methods in Satellite Image Processing| GNR607: Principles of Satellite Image Processing | GNR630: Introduction to Geospatial Technologies and Applications | GNR647: Microwave Remote Sensing | ES680: GIS for Environmental Planning and Management | ES 653: Environmental Impact Assessment.
- QGIS tutorials, SAR training presentations, and notes.

Centre for Urban Science and Engineering | Indian Institute of Technology Bombay, Mumbai, India Jan 2015 – Jan 2016

Project Research Associate

- Project title: Urban Form and Extreme Precipitation Events: Are compact cities more vulnerable to flooding?

JSR Planning & Research Consultants Sep 2014 – Dec 2014

GIS Engineer

- Landuse/Attribute mapping for Nuzvid/Gudivada/Eluru ULBS's under APMDP project.
- Pilot mapping work on Development plan for Banaganapalle

Aarvee Associates Architects, Engineers & Consultants Pvt. Ltd. Mar 2012 – Jun 2012

Trainee Urban planner

- Updation of Rajahmundry master plan
- Data collection for Census and data collection on socio-economic details from the concerned departments.
- Updation of Rajahmundry broad Land Use plan
- Digitization of Land use for the broad Land Use map of Rajahmundry and Kurnool towns
- Preparation of sector maps for CDP of seven towns (Barhi, Barela, Bhedaghat, Majholi, Sahapura, Katangi & Patan towns in Madhya Pradesh)

Research Interests

- Disaster Monitoring, Flood mapping, and Fire mapping
- SAR Polarimetry, Quad and Compact polarimetry.
- Urban Expansion Monitoring (UEM), Google Earth Engine (GEE), Machine Learning (ML), Urban Heat Island (UHI).

Technical Skill

- Programming Skill: MATLAB | Python | R | JS
- Software and Tools: ArcGIS | QGIS | ERDAS Imagine | ENVI | PolSARPro | SNAP | Earth Engine
- Drafting and Design Tools: AutoCAD

Research Projects

2018-2020	**GIS Engineer**, GIS based forest boundary mapping in parts of Navi Mumbai area.	Forest dept., Mumbai.
2019-2021	**Principal Investigator (PI)**, Urban form characterization and their backscattering library generation using temporal L-band SAR images for operational flood disaster response.	JAXA
2020-2021	**Principal Investigator (PI)**, European Space Agency (ESA) RSS Cloudtoolbox Service for image processing.	ESA

Publications

Peer Review Journal:

(J1) **Krishna, VV Sai**, Kamal Pandey, and Harish Karnatak. "Geospatial multicriteria approach for solid waste disposal site selection in Dehradun city, India." Current Science 113891, no. 112 (2017): 3. doi: 10.18520/cs/v112/i03/549-559.

(J2) **Vanama, Venkata Sai Krishna**, Dipankar Mandal, and Yalamanchili S. Rao. "GEE4FLOOD: rapid mapping of flood areas using temporal Sentinel-1 SAR images with Google Earth Engine cloud platform." Journal of Applied Remote Sensing 14, no. 3 (2020): 034505. doi: 10.1117/1.JRS.14.034505.

(J3) **V. S. K. Vanama**, Y. S. Rao, and C. M. Bhatt. "Change detection based flood mapping using multi-temporal Earth Observation satellite images: 2018 flood event of Kerala, India." European Journal of Remote Sensing. doi: https://doi.org/10.1080/22797254.2020.1867901

(J4) **Venkata Sai Krishna Vanama**, Mohamed Musthafa, Unmesh Khati, Gowtham R, Gulab Singh, Y. S. Rao. "Flood extent mapping of Kerala flood event in 2018 using ALOS-2 and temporal Sentinel-1 SAR images." Current Science (In press)

(J5) **V. S. K. Vanama**, Y. S. Rao, and C. M. Bhatt. "Rapid mapping of cyclone induced flood event through automated approach using multi-temporal Earth Observation (EO) images in a cloud platform." European Journal of Remote Sensing (Submitted)

(J6) **V. S. K. Vanama**, S. Dey, Y. S. Rao, "Rapid flood mapping through compact polarimetric RISAT SAR data", International Journal of Disaster Risk Reduction (IJDRR) (In preparation)

International/ National Conference:

(C1) K. V. S. Babu, and **Vanama, V.S.K.**, 2020, October. Brunt area mapping in Google Earth Engine (GEE) cloud platform: 2019 forest fires in eastern Australia. In IEEE Sponsored International Conference on Smart Innovations in Design, Environment, Management, Planning and Computing (ICSIDEMPC-2020). IEEE. **(In Press)**

(C2) **Vanama, V.S.K.**, Dhanashri Kulkarni, and Sanjay Shitole, 2020, October. Urban area classification with quad-pol L-band ALOS-2 SAR data: A case of Chennai city, India. In International India Geoscience and Remote Sensing Symposium (InGARSS 2020). **(In Press)**

(C3) **Vanama, Venkata Sai Krishna**, Sanjay Shitole, Unmesh Khati, and Y. S. Rao. "Split-window based flood mapping with L-band ALOS-2 SAR images: A case of Kerala flood event in 2018" IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2020, Hawaii, USA. **(In Press)**

(C4) Sanjay Shitole, Vijal Jain, **Vanama, Venkata Sai Krishna**, and Y. S. Rao. "De-speckling of synthetic aperture radar using discrete Fourier transform" IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2020, Hawaii, USA. **(In Press)**

(C5) **Vanama, V.S.K.** and Rao, Y.S., 2020, February. Real-time flood mapping with temporal SAR images using ESA CloudToolbox service. In 1st International Conference on Urban Science and Engineering (ICUSE-2020). **(In Press)**

(C6) **Vanama, V.S.K.**, Sanjay Shitole, and Rao, Y.S., 2020, February. Urban flood mapping with C-band RISAT-1 SAR images: 2016 flood event of Bangalore city, India. In IEEE International Conference on Convergence to Digital World – Quo Vadis (ICCDW-2020). IEEE. (In Press) [**Secured second prize**]

(C7) **Vanama, V. S. K.**, K. V. S. Babu, and Y. S. Rao. "Ground truth mapping with multi-temporal earth observation data in ESA CloudTool box: A case of Kerala flood event occurred in 2018." In 2020 International Conference on Emerging Smart Computing and Informatics (ESCI), pp. 133-136. IEEE, 2020. **[Bagged best paper award]**

(C8) **Vanama, Venkata Sai Krishna**, and Y. S. Rao. "Change detection based flood mapping of 2015 flood event of Chennai city using sentinel-1 SAR images." In IGARSS 2019-2019 IEEE International Geoscience and Remote Sensing Symposium, pp. 9729-9732. IEEE, 2019.

(C9) Kolekar, Dhanashri, **V. S. K. Vanama**, and Y. S. Rao. "Satellite Based Drought Assessment Over Latur, India Using Soil Moisture Derived from SMOS." International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences 42 (2018): 5.

(C10) Suresh, Babu KV, and **Venkata Sai Krishna Vanama**. "Fire Detection in a Varying Topography Using Landsat-8 for Nainital Region, India." In 2018 3rd International Conference for Convergence in Technology (I2CT), pp. 1-4. IEEE, 2018.

(C11) **Vanama, Venkata Sai Krishna**, Ch Praveen Kumar, and Y. S. Rao. "Rapid detection of regional level flood events using AMSR-E satellite images." In Proceedings of International Conference on Remote Sensing for Disaster Management, pp. 13-23. Springer, Cham, 2019.

(C12) **Vanama, Venkata Sai Krishna**, Y. S. Rao. "Spatio-temporal analysis of passive microwave remote sensing data for rapid detection of large scale flood mapping - a geospatial approach." In Proceedings of 38th Asian Conference of Remote Sensing (ACRS), New Delhi, India, 2019.

(C13) Alisha Chowdhury, **Vanama, V.S.K.** and Valliappan. AL. "Examining the Effect of the Physical Characteristics of the Urban Green & Blue Spaces in Heat Mitigation: A Case Study of Pune." In Proceedings of 38th Asian Conference of Remote Sensing (ACRS), New Delhi, India, 2019.

(C14) Babu, KV Suresh, **Venkata Sai Krishna Vanama**, Arijit Roy, and P. Ramachandra Prasad. "Assessment of forest fire danger using automatic weather stations and MODIS TERRA satellite datasets for the state Madhya Pradesh, India." In 2017 International Conference on Advances in Computing, Communications and Informatics (ICACCI), pp. 1876-1881. IEEE, 2017.

(C15) **VV, Sai Krishna**, Anil Kumar Dikshit, and Kamal Pandey. "Flood modelling with global precipitation measurement (GPM) satellite rainfall data: a case study of Dehradun, Uttarakhand, India." In Multispectral, Hyperspectral, and Ultraspectral Remote Sensing Technology, Techniques and Applications VI, vol. 9880, p. 98801A. International Society for Optics and Photonics, 2016.

Conference Presentations :

(CP1) **V. S. K. Vanama**, and Y. S. Rao, "Automatic thresholding based flood mapping with temporal Sentinel-1 images" presented at the National Symposium on Innovations in Geospatial Technology for Sustainable Development with special emphasis on NER during 20–22 Nov 2019 at North Eastern Space Applications Centre (NESAC), India.

(CP2) **V. S. K. Vanama**, and Y. S. Rao, "Spatial Identification of Flood Areas Using Temporal AMSR-2 Data" presented at the 4th World Congress on Disaster Management (WCDM-2019) during 29th Jan – 1st Feb 2019 at IIT Bombay, Mumbai, India.

(CP3) S. Babu K.V., **V. S. K. Vanama**, and Ridhika Aggarwal "Change detection based brunt area mapping using freely available Sentinel-2 images" presented at 4th World Congress on Disaster Management (WCDM-2019) during 29th Jan – 1st Feb 2019 at IIT Bombay, Mumbai, India.

(CP4) **V. S. K. Vanama**, S. Babu K.V., and Y. S. Rao, "Spatio-temporal Analysis of Chennai City Land Surface Temperature using Landsat 8 data," presented at the International conference on Urban Geoinformatics-2017, Delhi, India, 2017. (Poster)

(CP5) **V. S. K. Vanama** and Y. S. Rao, "Satellite Based Urban Flood Extent Mapping: A Case Study of Bangalore Metropolitan Region," presented at the National Symposium on Recent Advances in Remote Sensing and GIS with Special Emphasis on Mountain Ecosystems, Dehradun, India, 2016. (Poster)

(CP6) **V. S. K. Vanama**, S. Babu K.V., and K. Pandey, "Analysis of various fusion techniques for multi spatial resolution images," presented at the National symposium on Geomatics for Digital India, Jaipur, 2015.

(CP7) **V. S. K. Vanama**, K. Pandey, and B. D. Bharath, "Urban Water Information System (UWIS): A web based spatial decision support system for management and monitoring water utility assets," in FOSS4G-India 2015, Dehradun, India, 2015.

(CP8) **V. S. K. Vanama**, "Urban surface and sub-surface utility mapping in 3d using geospatial techniques – A case study of part of Dobhalwala ward, Dehradun, India," presented at the National seminar on Changing spectrum of Human Settlements and Planning Education, Amritsar, India, 2014.

Book chapters :

(B1) Gautam Dadhich, **Venkata Sai Krishna Vanama**, Hiroyuki Miyazaki, and Indrajit Pal, "Flood damage assessment with multi-temporal earth observation SAR satellite images: A case of Coastal flooding in Southern Thailand" In Disaster Resilience and Sustainability (2021), Springer. [In press]

Invited Presentations :

(P1) **V. S. K. Vanama**, "Applications of Earth Observation (EO) images in disaster management with special emphasis on flooding," Online presentation by Centre for Geo Informatics, Jamsetji Tata School of Disaster Studies, Tata Institute of Social Sciences (TISS), Sep 2020, Mumbai, India.

Awards and Achievements

- Received **best paper award** in IEEE International Conference on Emerging Smart Computing and Informatics (ESCI 2020) conference.
- Received **second prize** in IEEE International Conference on Convergence to Digital World – Quo Vadis (ICCDW-2020).
- IEEE Geoscience and Remote Sensing Society **Travel Grant**, IEEE GRSS and SAC-ISRO joint SMAP-NISAR Workshop on Soil Moisture and Agricultural Monitoring using Microwave Remote Sensing (Ahmedabad, India) February 2018.
- IEEE Geoscience and Remote Sensing Society **Travel Grant**, IEEE IGARSS (Valencia, Spain) July 2018
- Ph.D. Assistantship, Ministry of Human Resource Development, Govt. of India (New Delhi, India) Jan 2016 to Mar 2021.

Synergistic Activity

Peer Recognition:

- Journal Reviewer: Geocarto International, Taylor & Francis

Professional Membership:

- Associate Member: Institute of Town Planners (ITPI), India (2017-152)
- Student Member: Institute of Electrical and Electronics Engineers (IEEE)
- Student Member: IEEE Geoscience and Remote Sensing Society
- Life Member: Indian Society of Remote Sensing (ISRS), India (L-4575)
- Student Member: Deep Foundations Institute

Linguistic Aptitude

- To Read: English, Telugu, Hindi
- To Speak: English, Telugu, Hindi
- To Write: English, Telugu, Hindi
- Native Language: Telugu.

Declaration and Sign Off

I hereby declare that all the details furnished above are true to the best of my knowledge and belief.

Date: 08 Jan 2021 ----------

(Venkata Sai Krishna Vanama)