

Education

- Doctor of Philosophy – PhD, Remote Sensing & Image Processing (GPA 4.0/4.0*)** Pursuing
Emphasis: Environmental & Biophysical Modelling, Water Quality Analysis
Department of Geography, (Remote Sensing and Spectroscopy Lab)
The University of Georgia at Athens (UGA),
Athens, GA, USA
- Master of Technology – Remote Sensing & GIS (GPA 3.7/4.0; CGPA: 8.62/10)** Graduated, July 2021
Specialization: Satellite Image Analysis and Photogrammetry
Thesis: Object Oriented CNNs for Automated Feature Extraction from Satellite Imagery
Indian Institute of Remote Sensing (IIRS),
Indian Space Research Organization (ISRO),
Dehradun, Uttarakhand
- Bachelor of Technology – Computer Engineering (GPA: 4.0/4.0; CGPA: 9.62/10)** Graduated, May 2019
Electives: Digital Image Processing & Artificial Intelligence
Major Project: Machine Learning and NLP based Text Classification for Document Summarization
Chandubhai S Patel Institute of Technology,
Charotar University of Science and Technology (CHARUSAT),
Anand, Gujarat

Skills

- Programming: Python, C, C++, JAVA, R
- Image Processing: OpenCV, Pillow
- Natural Language Processing: NLTK
- Google Cloud Services, server handling
- Project/Team Management
- Satellite Image Processing: SNAP, ERDAS, ENVI, QGIS, GDAL
- Machine Learning & Deep Learning: fastai, sklearn, keras, pytorch
- Remote Sensing, Statistics, Data Analysis, Google Earth Engine
- Software & Web Development: Full stack; PHP, MySQL, JavaScript
- Web Scraping, Version Control – GitHub & BitBucket

Research/Work Experience

- **Graduate Teaching Assistant** *Aug 2021 – Present*
University of Georgia, GA USA
 - Instructor of Record for: GEOG 1111L: Intro. to Physical Geography Lab; Teaching 60 undergrad and grad students
- **GIS/Geo-AI Consultant** *June 2021 – Present*
BeZero Carbon, London, UK
NotionMind Technologies, Gujarat, India
 - GIS based services: Creating and publishing maps, user-groups and MCDM analysis
 - Live dashboard development in Google Earth Engine for GIS/satellite data visualization
 - Developing AI-based robust change detection algorithms using satellite optical and SAR data
- **Machine Learning Intern** *Oct 2020 – Feb 2020 (remote)*
Scanta, San Francisco, CA
 - Researching and developing Natural Language Processing based solutions for ChatBot security
 - Developing deep learning based algorithms to protect websites from AI bots
 - Working with BERT, RoBERTa, GPT-2, GPT-3
- **Applied Research Intern (Machine Learning & NLP)** *Dec 2018 – June 2019 (7 mos)*
Centre for Indian Language Technology (CFILT) Lab,
Indian Institute of Technology, Bombay (IITB) | Major Advisor: Prof. Ganesh Ramakrishnan
 - Automated laborious and manual task of feedback categorization, done in 30 mins which earlier used to take a few days
 - Sampled more than 5 million tuples of textual data, developed algorithm for sentence pair similarity
 - Led a team of 4, managed development & deployment, oversaw the client interaction and recruitment process
 - Served as student mentor to incoming interns at IITB.

▪ Remote Sensing Research Intern

Jul 2018 – Aug 2018 (6 weeks)

Remote Sensing and Spectroscopy Lab,

University of Georgia, USA | Major Advisor: Prof. Deepak Mishra | CyanoTRACKER – NSF Funded Project

- Developed tool to fetch potential CyanoHAB locations based on tweets – now being used daily in CyanoTRACKER
- Developed GEE based dashboard for water quality analysis for Sentinel-2 & Sentinel-3
- New approach for Rayleigh correction in GEE for Level-1 Sentinel-3 data
- Continued research post internship: CyanoHAB monitoring and detection for Indian water bodies

▪ Full Stack Web developer, SEO Specialist and Creative Content Writer

Aug 2017 – Jan 2018 (5 mos)

KickStart Solutions LLP, Vadodara

- Full Stack Web Development in Django and HTML + CSS stack
- Search Engine Optimization (AdWords) and SPAs; Robotic Process Automation, Content Writing

Publications

6. Maniyar, C. B., Kumar, A. & Mishra, D.R. (2022). **Continuous and Synoptic Assessment of Indian Inland Waters for Harmful Algae Blooms.** *Harmful Algae*, 111, 102160 [[Article](#)]
5. Maniyar, C. B. & Kumar, A. (2021). **Generative Adversarial Network for Cloud Removal from Optical Temporal Satellite Imagery.** *Soft Computing for Problem Solving* (pp. 481-491). Springer. [[Chapter](#)]
4. Maniyar, C.B. 2021. **Automated Feature Extraction from High Resolution Satellite Imagery using Object-based Fully Convolutional Networks and Cyclical Learning.** *Masters' Thesis at Indian Institute of Remote Sensing, Class of 2021* [[Thesis](#)]
3. Maniyar, C.B. & Kumar, M. 2021. **Deep Learning based Improved Automatic Building Extraction from Open Source High Resolution Unmanned Aerial Vehicle (UAV) Imagery.** *Unmanned Aerial Systems in Geomatics* (Under Review) [[Preprint](#)]
2. Maniyar, C.B., Kumar, A., & Mishra, D.R. (2020). **Cloud Based Approach for Continuous Monitoring and Assessment of Inland and Estuarine Water Environments using Sentinel-3 OLCI data.** *Proceedings of Recent Advances in Geospatial Technology and Applications* (pp. 151-157). Dehradun: Indian Society of Remote Sensing [[Article](#)]
1. Maniyar, C. B., Bhatt, C. M., Pandit, T. N. & Yadav, D. H. (2019). **CHEERBOT: A Step Ahead of Conventional ChatBot.** *Next-Generation Wireless Networks Meet Advanced Machine Learning Applications* (pp. 306-322). IGI Global. [[Chapter](#)]

Conference Presentations

8. Maniyar, C.B., Kumar, M. “Improved Automated Building Extraction from High Resolution Remote Sensing Imagery using Time-Optimized Deep Learning Techniques” *American Geophysical Union (AGU) Fall Meeting 2021*, New Orleans, USA, December 2021 [[Abstract](#) | [Poster](#)]
7. Maniyar, C.B., Kumar, A. & Mishra, D.R., “Frequent Synoptic Monitoring of Cyanobacterial Harmful Algal Blooms for Potential Prevention of Disease Outbreak” *CDC's Place And Health Conference*, Virtual, November 2020 [[PPT](#)]
6. Maniyar, C.B., Kumar, M. “Deep Learning based Improved Automatic Building Extraction from Open Source High Resolution UAV Imagery” *2nd International Conference on Unmanned Aerial Systems in Geomatics*, Indian Institute of Technology, Roorkee, Virtual, April 2021 – (Best Paper Award) [[PPT](#) | [YouTube](#)]
5. Maniyar, C.B., Kumar, A., Mishra, D.R., “Web-based Interactive Approach for Continuous Monitoring of Indian Inland and Estuarine Waters for Harmful Algal Blooms.” *National Symposium on Remote Sensing for Environment Monitoring and Climate Change Assessment: Opportunities and Challenges*, Indian Society of Remote Sensing (ISRS) and Indian Society of Geomatics (ISG), Virtual, December 2020 – (Best Paper Award) [[PPT](#)]
4. Maniyar, C.B., Mishra, D.R. & O'Halloran T., “Ecological Impact of Hurricane Matthew on South Carolina Coastal Marshes and Forests using Time-Series Analysis.” *National Symposium on Remote Sensing for Environment Monitoring and Climate Change Assessment: Opportunities and Challenges*, Indian Society of Remote Sensing (ISRS) and Indian Society of Geomatics (ISG), Virtual, December 2020 [[PPT](#)]
3. Maniyar, C.B., Banda, T., Krishna, D., Sharma, C. “Effective Cyanobacterial Harmful Algal Blooms Monitoring using Open Social Media Platforms and Google Earth Engine.” *National Symposium on Remote Sensing for Environment Monitoring and Climate Change Assessment: Opportunities and Challenges*, Indian Society of Remote Sensing (ISRS) and Indian Society of Geomatics (ISG), Virtual, December 2020 [[Poster](#)]
2. Maniyar, C.B., Kumar A. “Generative Adversarial Network for Cloud Removal from Temporal Optical Satellite Imagery.” *SoCProS 2020: 10th International Conference on Soft Computing for Problem Solving at Indian Institute of Technology (Indore)*, Virtual, December 2020 [[PPT](#) | [YouTube](#)]
1. Maniyar, C.B., Kumar, A., Mishra, D.R., 2020. “Cloud Based Approach for Continuous Monitoring and Assessment of Indian Inland and Estuarine Water Environments using Sentinel-3 OLCI data”. *Indian Society of Remote Sensing: National Seminar*, Indian Institute of Remote Sensing, Dehradun, Uttarakhand, India, March 2020 (Industry appreciation award from Hexagon Geospatial) [[PPT](#)]

Relevant Projects

1. Object Oriented CNNs for Multiscale Building Extraction using Res-U-Net and PixelShuffle with Cyclical Learning (MTech Thesis @IIRS) Nov 2020 – June 2021 Advisor: Mrs. Minakshi Kumar	Attempting to solve known issues of irregular shapes, blurred boundaries and restricted spectral channels in remote sensing building extraction. Developing a single network for multiscale predictions. Applying Cyclical Learning concepts for time and resource (GPU) optimization. Project objectives presented in conferences/journals	PyTorch, fastai, Python, GDAL
2. CYANOKHOJ Protecting water bodies around the world from harmful algal blooms; with CyanoTRACKER-@UGA Jul 2018 – Present Advisor: Prof. Deepak R. Mishra [GEE Webapp] [All-India Map GEE]	1. Developed an interactive dashboard in Google Earth Engine for quick analysis of waterbodies around the world for CyanoHABs. 2. Used data analytics and geocoding on Twitter data to extract and pinpoint potential bloom locations. 3. Performed case study on Indian waters for CyanoHABs – country wide CyanoHAB map developed Now published as an Article	Python, Twitter API, JavaScript, Google Earth Engine, SNAP, CODA (ESA)
3. Impact of Hurricane Matthew (Oct 2016) on the South Carolina Pine Forests-@UGA Apr 2020 – Sep 2020 Advisor: Prof. Deepak R. Mishra	Matthew pushed a heap of water from an adjacent salt marsh site into the forest. Performed 4-year time series analysis using various vegetation indices on Sentinel-2 to assess the pine forest mortality in Google Earth Engine and obtained a clear die-off signal for the affected forest patch in the phenology curve	Google Earth Engine, SNAP, QGIS, Satellite Image Processing
4. Cloud Removal from Sentinel-2 Imagery using Conditional GANs - @IIRS Apr 2020 – Jun 2020 Advisor: Dr. Anil Kumar [GitHub Repo]	1. Using the pix2pix conditional GAN architecture with a novel augmented single-scene training approach on solely optical data to learn the mapping of a cloudy image to its cloud-free counterpart, 2. Training and testing on Sentinel-2 A/B data Now published as a book chapter	Python, CNN, Deep Learning, Keras, Satellite Image Processing
5. Supervised Classification of Satellite Images using Spectral Modulation Feb 2020 – Mar 2021 [GitHub Repo]	Attempting supervised classification without using any actual learning algorithms. A modulation function is defined and each pixel is classified using its modulation pattern. Efficient in terms of time and resources w.r.t ML/DL.	Python, GDAL, numpy, spectral modulation
6. Satellite Image Processing for Feature Identification - Detecting Water Bodies using Water Indices Nov 2019 – Dec 2019 [GitHub Repo]	1. Using Sentinel 2, level 2A & Landsat-8 images to implement different indices such as NDWI for vegetation and water-bodies, NDCI, Chl-a to detect and assess the quality of water-bodies 2. Preparing binary feature maps after performing histogram thresholding for feature extraction	Python, gdal, rasterio, geopandas, QGIS, Image masking, Image kernel processing
7. Text Classification and Context Mining for Document Summarization Deep Learning aided text alignment - @IITB Dec 2018 – Jun 2019 Advisor: Prof. Ganesh Ramakrishnan [GitHub Repo]	1. Categorically summarizing responses into a well formatted document by text classification and context mining. Exercising weak supervision over Wikipedia Articles and Talk Comments using Machine Learning & Deep Learning. 2. Sentence pair similarity algorithm and Keyword based context mining algorithm.	Python, BERT, NLP, word embedding, Machine Learning, Django
8. CHEERBOT (ML, NLP) Sep 2017 – Jun 2018 [GitHub Repo]	A chatbot that analyzes the user's sentimental state using text analysis, voice analysis and facial expression, and strikes up a cheerful conversation if the user is sad Now published as a book chapter	Python, NLP, NLTK, Voice Analysis, Machine Learning
9. CentralEased (ML, Face Recognition) Feb 2018 [GitHub Repo]	An attempt to create a centralized database using machine learning over all existing databases of a person's information, based on his/her face picture as ID/ Primary Key	Python, Flask, OpenCV, HTML, CSS, Machine Learning
10. Management Systems as Web Apps Feb 2017 – Apr 2017; Jan 2018 [GitHub Repo 1] [GitHub Repo 2]	1. Developed a Seminar Hall Booking System for CHARUSAT university, now being used daily 2. Developed prototype for Online Transcript Management/Acquisition System for Indian universities	HTML, CSS, Bootstrap, PHP, JavaScript

Positions of Responsibility

- **Open Source Project Mentor** *Oct 2020 – Apr 2021*
Developer Student's Club, Dhirubhai Ambani Institute of Information Technology, Gujarat
 - Mentoring 20 undergraduate and graduate students pan India on my open source projects.
 - Domains: Deep Learning, Satellite Image Processing, Machine Learning, NLP, Web Development, Google Cloud
 - Tech/Tools stack: Python, HTML, CSS, Bootstrap, GDAL, Rasterio, NLTK, Tweepy, Numpy, Pandas, OpenCV

- **Student Mentor** *Mar 2019 – Present*
Various Institutes
 - Mentoring/Mentored at: IIT Bombay, IIRS-ISRO, Guru Nanak Dev University, Baroda High School O.N.G.C.
 - Mentoring students on Python, Satellite Image Processing, Machine Learning, Remote Sensing Applications, NLP

- **Founding Member and Mentor** *Nov 2011 – Present*
Astronomy Club, Baroda High School (O.N.G.C)
 - Affiliated with Astronomers Without Borders
 - Conducting celestial observations, handling telescope, delivering lectures on High School Astronomy & Cosmology

Awards and Achievements

1. Best Paper Awards:
 - a. *2nd International Conference on Unmanned Aerial Systems in Geomatics – April 2021*
 - b. *National Symposium on Remote Sensing for Environment Monitoring and Climate Change Assessment: Opportunities and Challenges – Dec 2020*
2. Awarded merit based academic scholarships
 - a. ₹ 30,000: Golden Jubilee Fellowship, IIRS Masters' Semester 3(Department Rank 1)
 - b. ₹ 56,000: Golden Jubilee Fellowship, IIRS Masters' Semester 2 (Department Rank 1)
 - c. ₹ 32,000: Golden Jubilee Fellowship, IIRS Masters' Semester 1 (Department Rank 1)
 - d. ₹ 40,000: CHARUSAT Bachelors' Second Year (Institute Rank 1)
 - e. ₹ 40,000: CHARUSAT Bachelors' First Year (Institute Rank 1)
3. Selected for Bachelors' final year project at U.R. Rao Satellite Centre (URSC - ISAC), ISRO (Bangalore)
4. Core Team Member – Developers Student Club run by Google, CHARUSAT
5. Editor in Chief - 'The Quill', CHARUSAT's university magazine