

Sandeep Kumar Chittimalli

Email: Sandeepkumarchittimalli@gmail.com

Phone: +14699800983

Masters in Electrical Engineering (Emphasis in Image Process & Remote Sensing)

South Dakota State University

Google Scholar: <https://scholar.google.com/citations?user=OO7rpLMAAAAJ&hl=en&oi=ao>

Research Interest

Artificial Intelligence, Machine Learning, Data Science, Remote Sensing, Ocean Science, Water Quality, Earth Observation Sensors Cal/Val, Image Processing, Satellite Image Processing

Work and Research experience

Synectics for Management Decisions Inc / Contractor@NSF May 2021 - till now
Data Scientist

- Built and administrate Data Science Desktop Environments to assist NSF data-Science User Community in running crucial Machine Learning (ML) models that play a critical role in decision making, as well as enabling the applications of Artificial Intelligence at the foundation.
- Conducting research and developing Proposal Topic search tool to identify keywords and related topics from a cluster of Remote sensing proposal data particularly in the fields of Ocean Science, Land-cover, Vegetation using word-embedding algorithms such as GloVE, Wor2Vec, Sagemaker Blazing Text and searchmetrics.
- Building various AI/ML tools to support Ocean Science Scientist group at NSF.
- Enhancing current natural language processing (NLP) methods such as word vector, similarity scores, and proposal binning to create new applications using available Earth-observation proposal data within NSF.
- Developed a cloud-native Data Science Environment and infrastructure to assist analytics and the transition of current machine learning projects and data science applications to a cloud-based data processing environment.
- Developing machine learning, predictive, forecasting models for various NSF proposal data. Assisting in thought leadership and training staff on analytics, data science, machine learning, and other related topics.
- Using Machine and deep learning techniques to improve accuracy of current Optical character recognition (OCR) algorithm which extracts text from images.
- Research, document end to end, prepare proof-of-concept reports (POC), and employ new data science research tools to the data science user's community that helps to derive unique findings; I ensure all these research reports are created using credible qualitative, and quantitative methodologies based on key insights from historical and current studies.
- Utilizing Cloud-based services, Elastic Computing Cloud (EC2), Elastic MapReduce (EMR), AWS Comprehend, Sagemaker, Elastic Kubernetes Service (EKS), Redshift to build and deploy seamless Machine Learning business products.
- Assisted in developing advance analytical tools such as Open Data Applications, Data Dictionaries, Data science engineering pipelines, and built Data Visualizations apps using R-Shiny, Jupyter Hub Voila server, Streamlit, Plotly Dash, Bokeh, Tableau, and Oracle Business Intelligence Enterprise Edition (OBIEE), etc.
- Automated and Optimized routine scripts such as Proposal download report process which take longer time when users submit bulk requests.

Capital One Sr Data Analyst

Feb 2021 - May 2021

- Created Natural Language Processing (NLP) modeling tools for an Artificial Intelligence (AI) driven chatbot in Python.
- Designed various computing platforms, multiprocessing data analytic pipeline tools in python on AWS Cloud that consumed massive structured and unstructured data from various sources and stored in Snowflake. Finally applied machine learning algorithms to solve various business problems.
- Part of the California consumer privacy Act (CCPA) project, I developed automated scripts to mask any personal information (PI) and non-personal information (NPI) in the data. Redacted and labeled PI items in DataLakes using a machine learning-based natural language processing (NLP) tool like Amazon Comprehend and used entity scores data for each detected element for additional validation.

Synectics for Management Decisions Inc / Contractor@NSF Feb 2021

Oct 2020 -

Data Scientist

- Evaluated various data visualization tools such as Voila, Bokeh, Plotly Dash Streamlit to deploy AI/ML apps in python for collaborative sharing and prepared a proof of concept (POC).
- Built and managed on-premises Data Science Desktop environments that include installation, configuration of the tools that support to latest advance analytics scripts like Python, R, and Maintain a centralized process to run Data science analysis.
- Provided initial document for smooth migration of On-premises Data Science environment to cloud, support and serve to give best solutions to perform data science tasks on various cloud platforms and to reduce impact for data science users.
- Automated scripts to get R and python data science users activity and kill data science pipelines those running for longer hours and consuming lot of system resources and implemented an automated script which gives the usage of Data Science Desktops and alerts when it exceeds minimum thresholds.

Data Analyst Capital One

July 2018 - Oct 2020

- Developed a daily alert to detect anomalies in digital messaging data volume utilizing Machine learning algorithms that helped many product owners to save time and capture failure events.
- Creating images-based decision plots and generated daily Data quality monitoring reports using Capital One AI Chabot data.
- Implemented A/B testing to test the impact of promotional offers, messaging, and email campaigns.
- Created various machine learning models for business needs and deployed them on AWS cloud. Optimized various data science pipelines and helped team transition between various systems.
- Developed various Time series and Predictive modeling for AI chatbot data. Actively participated in developing NLP tools for modeling Text analytics.
- Built a library of models and various packages in python and implemented reusable scripts and introduced new skills to the team to produce consistent-streamlined business intelligence results.
- Built automated daily KPI reporting workflow and pipelines that gather and aggregate data from many sources. Lead and implemented many data-pipelines using AWS lambda

and Python, which saved business in terms of time and cost.

- Assisted team members in Running big data analytic jobs, data science applications in various computation engines such as Databricks, spark, Elastic MapReduce (EMR) and Elastic Cloud (EC2).
- Built data pipelines, data quality, and visualizations for a variety of sources such as Kafka topics, Streaming Data Platform(SDP), S3, analytical raw data, and so on.
- Developed performance-optimized Tableau dashboards to monitor product performance, allowing business stakeholders to self-serve data needs, and improving analytics productivity.

USRA / Contractor @NASA (GSFSC)
Research Analyst and Visiting Scientist

Feb 2017 - July 2018

- Developed and performed Intercomparison of satellites (Landsat-Sentinel) and Cross-Cal terms of Radiance and reflectance for aquatic applications.
- Learned and used MODTRAN for Atmosphere corrections and Relative Spectral Responses (RSR) corrections.
- Developed Python and Linux scripts to use NASA's Sea-viewing Wide Field-of-view Sensor (SeaWiFS) Data Analysis System (SeaDAS) tool and generate level-2 products.
- Developed atmospheric corrections using SeaDAS for Landsat series, Sentinel series, MODIS, VIIRS satellite data.
- Developed a Landsat/Sentinel acquisition planner in Python Django, utilizing Two-line Element (TLE). This tool helped field associates to forecast satellite overpasses and prepare in-advanced in order collect and compare ground (field) water measurements with satellite data.
- Implemented algorithms and performed Cross-calibration and Inter-comparisons of various satellite sensors data to use for Land and aquatic applications.
- Developed various Image process techniques in Python for Landsat, Sentinel satellites level-1 and level-2 products and analyzed various satellite preliminary datasets on a pixel level using image processing techniques.
- Studied and applied various Machine Learning concepts to detect outliers in satellite spatial and temporal data.
- Developed an algorithm and automated scripts that leveraged Landsat/Sentinel data to detect Algal blooms in aquatic data. Using SeaDAS (Level 2) historical data, it captured dynamic fluctuations within Chl-a and TSS. This concept prompted water managers to make swift choices regarding where satellites detected anomalies and suspicious blooms.
- Utilized MAD Z-score, ARIMA, SVM, Grabs and a few machine learning techniques to detect anomalies in spatial and temporal datasets.
- Developed automated scripts and Linux batch scripting for bulk satellite data processing and batch processing of various levels of satellite data.
- Implemented predictive models to predict future anomaly events based upon spatial and temporal time series satellite data.
- Maintained scripts and ran SLURM jobs on High Performance computing (HPC) machines and helped the team on various projects and purposes.
- Utilized latest scripting languages such as Python, R, Statistics, and machine learning algorithms and studied global water lakes satellite data to study retrieval improvements.
- Maintained a good relationship with various partners and Stakeholders around the globe.

- Automated scripts and developed tools to download data from Amazon S3 buckets, United States Geological Survey (USGS) archive which saved project time.
- Paper publications, Presentations, and talks.

Acknowledgements and Projects Supported

- Sentinel-2 Multispectral Instrument (MSI) data processing for aquatic science applications: Demonstrations and validations.

Remote Sensing of Environment (2017) publication link : [Acknowledged in page:56](#)

- Assessment of atmospheric correction algorithms for the Sentinel-2A Multispectral Imager over coastal and inland waters.

Remote Sensing of Environment (2019) publication link : [Acknowledged in page:282](#)

- Predicting microcystin concentration action-level exceedances resulting from cyanobacterial blooms in selected lake sites in Ohio.

Remote Sensing of Environment (2020) publication link : [Acknowledged in page:7](#)

- Aquatic Science and Applications Enabled by the Landsat 8 Operational Land Imager.

Link: <https://agu.confex.com/agu/os18/meetingapp.cgi/Paper/303949>

- Geospatial Monitoring of the SDGs Sharing experiences on indicator 6.6.1 on freshwater related ecosystems, and exploring opportunities for better monitoring of the land-water-ocean nexus

Link: https://ggim.un.org/meetings/2017-Mexico/documents/NASA_EO4SDGs.pdf

South Dakota State University Graduate Research Assistant

May 2015 – Dec 2016

- Implemented Radiometric algorithms (Radiance and Reflection based calibrations) for whole Landsat satellites data archive (40 years of Landsat data).
- Used EO-1 Hyperion (hyperspectral imager) to build spectral band adjustment factor (SBAF) for other Landsat/Sentinel datasets.
- Implemented automated scripts in Matlab/Python to extensively use Pseudo invariant calibration sites (PICS) for cross calibrations and validations of satellite datasets.
- Worked on Landsat MSS series and gained exceptional knowledge in this area.
- Improved uncertainty of the past 40 decades and future upcoming data products of Landsat's. Implemented image processing algorithms using MATLAB and Python.
- To find more calibration Region of Interest (ROI) sites analyzed Normalized Difference Vegetation Index (NDVI), Enhanced Vegetation Index (EVI) and Bidirectional reflectance distribution function (BRDF) characteristics.
- Developed multiple statistical tests in Python and MATLAB to validate results.
- Developed a Python application to find simultaneous Landsat satellite overpasses data which made it easy for calibration and save time.
- Documented the problems and progress of project most accurately.
- Developed number of automated scripts to download Landsat data from United States Geological Survey (USGS) archive.
- Presented research and calibration results in Landsat Science conference meetings. (<https://landsat.usgs.gov/lst-meetings-presentations-search>)
- Paper publications, Presentations, and talks.

South Dakota State University
Graduate Teaching Assistant

Jan 2015 – May 2015

- Handled lab sessions on Digital Systems.
- Taught Digital Systems lab projects using PIC Micro Controller, Register-transfer level(RTL) designs on Field Programmable Gate Array (FPGA).
- Taught students Verilog coding and algorithms develop projects.
- Performed routine jobs such as scrutinizing during Tests and grade exam papers and clarifying undergrad subject questions.

Young Minds Technology Solutions
VLSI and Imaging Engineer

Aug 2012 – Aug 2014

- Designed image processing projects according to requirements using Verilog and Matlab.
- Implemented face detection algorithms using Verilog and Matlab and deployed them on Field Programmable Gate Array (FPGA's).
- Gained good understanding in Machine learning concepts and computer vision algorithms.
- Implemented and worked with IRIS data, K-Clustering's, Support vector machine. (SVM), and Self-organized map (SOM's) in Python and Matlab.
- Implemented image processing algorithms using Gabor filters for disease detection, motion detection algorithms, Gaussian filters, Haar classifiers, and Adaboost algorithms in Matlab and Verilog.

Teaching, Training and Academic Experience

Jan 2013 – May 2013

(JB Institute computer Technology, Chadalawada Ramanamma Engineering College)

Guest Lecturer (Part of Young Minds Technology Solutions field work)

- Taught courses such as Digital Image Processing, Switching Theory and Logic Design (STLD), Verilog, Very High-Speed Integrated Circuit (VHSIC) Hardware Description Language(VHDL), Matlab.
- Helped graduate students to implement projects using tools such as FPGA, VHDL, Verilog, MATLAB, and Image processing.

Intern and Project Trainee

Apollo Computing Laboratories (P) Ltd

Jan 2012 – Mar 2012

Intern Trainee

- Part of the Final year Project and thesis work developed a satellite communication data sync prototype called 'Frame Synchronizer' using Verilog language.

Academic Credentials

MS in Electrical Engineering with emphasis in Image Processing

South Dakota State University, Brookings, South Dakota, USA

Jan 2015 – Dec 2016

Cumulative GPA (3.3), Core courses and Seminar cumulative GPA (3.6)

Project 1: 3D Object and Image Modelling by Phase Shifting Profilometry and Gamma Correction.

Project 2: Canon EOS 450D Radiometric Calibration.

Master's Thesis: "Reflectance-Based Calibration, and Validation of Landsat Satellite Archive" (Available at :

<https://openprairie.sdstate.edu/cgi/viewcontent.cgi?article=2104&context=etd>)

Master of Technology in VLSI System Design

Jawaharlal Nehru Technological University – Hyderabad (India)

Mar 2013 – Nov 2014**Cumulative GPA (3.90)****Bachelor of Technology in Electronics and Communication Engineering**

Jawaharlal Nehru Technological University – Hyderabad (India)

Sep 2008 – May 2012**Cumulative GPA (3.70)****Project:** Image Enhancement and Noise Removal using Adaptive Bilateral Filters.**Thesis:** Frame Synchronizer (A module which synchronizes and captures data coming from satellites).**Journals, Conference Papers & Technical reports****Journals:**

1. Sentinel-2/Landsat-8 product consistency and implications for monitoring aquatic systems, Remote Sensing of Environment, Volume 220, 2019, Pages 19-29, ISSN 0034-4257, <https://doi.org/10.1016/j.rse.2018.10.027>. (<http://www.sciencedirect.com/science/article/pii/S0034425718304814>), Nima Pahlevan, Sandeep K. Chittimalli, Sundarabalan V. Balasubramanian, Vincenzo Vellucci.

Conference papers:

1. Cibele Teixeira Pinto, Sandeep Chittimalli, Larry Leigh, Timothy Ruggles, Dennis L. Helder, "A reflectance-based cross calibration of the Landsat sensors," Proc. SPIE 10402, Earth Observing Systems XXII, 104021C (5 September 2017).

Technical Papers and Thesis

1. SDG Indicator 6.6.1. Change in the extent of water related ecosystems over time. Methodology for the use of satellite-based Earth observations datasets and respective tools for country level reporting, October 2017, NASA, University of Maryland, UN Environment, Earth Observation sustainable goals, Group on Earth Observations.
2. Reflectance-based calibration and validation of the landsat satellite archive, SK Chittimalli, South Dakota State University.

Talks, Presentations, Support, Posters and Invited

1. Dig South Tech Summit : Featured Speaker **June 2026**
Location: South Carolina, Charleston
Link: <https://digsouth.com/techsummit/#speakers>
2. GCSAYN Cohort 4 Internship and Mentorship 2025 Graduation Ceremony **Dec 2025**
Location: Virtual
3. **AGU 2025 Open Science Pavilion** **Dec 2025**
Link: [Open Science Pavilion at AGU25 | AGU Open Science Leadership](#)
Session: <https://agu.confex.com/agu/agu25/meetingapp.cgi/Session/277762>
4. AGU 2025 Open Science & Data Expert Volunteer **Dec 2025**
Link: [Data Help Desk - ESIP](#)
5. ISG ISRS National Symposium 2025 **Nov 2025**
Location: India, IIIT Khargpur
Link: [ISG - ISRS National Symposium 2025](#)
6. Landsat/Sentinel-2 for aquatic science and applications: Where are we now and where we want to be? **Aug 2022**
Link: https://landsat.usgs.gov/landsat/landsat_science_team/2022-08-16_Pahlevan_AquaticApplications.pptx

7. Aquatic Science and Applications Enabled by the Landsat 8 Operational Land Imager
Feb 2018
Location: Ocean Science, Portland, Oregon, USA.
Link : <https://agu.confex.com/agu/os18/meetingapp.cgi/Paper/303949>
8. Landsat-Sentinel-2 constellation for monitoring aquatic systems across the United States
Feb 2018
Link: https://landsat.usgs.gov/landsat/landsat_science_team/2018-02-Pahlevan_SSAI.pdf
9. Geospatial Monitoring of the SDGs-Sharing experiences on indicator 6.6.1 on freshwater related ecosystems, and exploring opportunities for better monitoring of the land-water-ocean
Nov 2017
Location: NASA GSFC, Green belt, Maryland USA.
Link : https://ggim.un.org/meetings/2017-Mexico/documents/NASA_EO4SDGs.pdf
10. Landsat-Sentinel-2 for Aquatic Science Data: Steps Towards Transitioning from Research to Operations
11. **Location:** Pecora 20-USGS, Sioux Falls, SD, USA. **Nov 2017**
Link : http://pecora.asprs.org/pecora20/wp-content/uploads/2017/11/Pecora-Final-Program-web_11-2-1.pdf
12. Landsat-Sentinel-2 constellation for regular monitoring of global water quality: current status & future needs
Jul 2017
Location: USGS, Sioux Falls, SD, USA
Link: https://landsat.usgs.gov/landsat/landsat_science_team/2017-07-Pahlevan_Aquatic.pdf
https://landsat.usgs.gov/landsat/landsat_science_team/LST-2017-07-files.zip (File Name : 2017-07_Day2_Pahlevan_Aquatic.pdf),
13. Reflectance-based Calibration of the Landsat Archive: Landsat-8 OLI to Landsat-1MSS
Mar 2017
Location : CEOS WGCV IVOS Meeting Tucson, AZ, USA
Link: [Reflectance-based Calibration of the Landsat Archive: Landsat-8 OLI to Landsat-1MSS](#) , [Alternate Link](#)
14. Reflectance-based Calibration of the Landsat Archive—Wrap-up **Jan 2017**
Link: https://landsat.usgs.gov/landsat/landsat_science_team/2017-01-Helder_ReflectCalibration.pptx
15. Reflectance-Based Cross-Calibration of Landsat Sensors Or... MSS Calibration: The Final Word! **Jul 2016**
Location: Landsat Science Team Meeting, McCrory Gardens Education and Visitor Center, Brookings, SD
Link: [Reflectance-Based Cross-Calibration of Landsat Sensors Or... MSS Calibration: The Final Word!](#)
16. USGS MSS Collection Plans and TIRS SSM Update **Jul 2016**
Link: https://landsat.usgs.gov/landsat/landsat_science_team/2016-07-Morfit_MSS_Collection_Plans.pptx
17. Maximizing the Value of the Landsat Archive for Forest Change Applications
Link: https://landsat.usgs.gov/landsat/landsat_science_team/2016-07-Cohen-LandsatScienceTeamMeeting_%20July_2016_2.pptx **July 2016**
18. Improvements on Landsat MSS data Radiometric Calibration **Jun 2016**
Location: Landsat Technical Interchange Meeting-USGS, Sioux Falls, SD, USA.

19. Reflectance based Cross-calibration of MSS and TM sensors data-current status. **Jan 2016**
Location: Landsat Technical Interchange Meeting, Virginia Polytechnic Institute. USA.
Link: https://landsat.usgs.gov/landsat/landsat_science_team/2016-01-MSS-Calibration-Comments.pptx, From Slide - 9
20. WiMAX Technology and its applications **Aug 2011**
Location: Srinidhi Institute of Science and Technology, Hyderabad, India
21. Nanotechnology and its impact on Integrated Chip Technology **Jul 2010**
Location: JB institute of Engineering and Technology (JBIET), Hyderabad, India.

Peer Reviewer | Program Committee (PC) & International Program Committee (IPC) Member

National & International Conferences

- 13th IEEE Conference on Systems, Process & Control (ICSPC 2025) – Malacca, Malaysia
- 22nd IEEE International Colloquium on Signal Processing & Its Applications– Langkawi, Malaysia
- IEEE International Conference on Interdisciplinary Approaches in Technology and Management for Social Innovation Gwalior, India
- 7th International Symposium on Advanced Electrical and Communication Technologies (ISAECT 2026) – Mohali, India
- BDAA First International Conference on Big Data Analytics & Applications (BDAA' 2025) – Innsbruck, Austria
- IFIP TC11 Information Security & Privacy Conference (SEC) – Perth, Australia
- 2nd International Conference on Recent Trends & Advances in Water Science, Remote Science & Climate Change – IIT Jammu, India
- 1st International Conference on Deep Learning Innovations for Smart Humanized AI – Jaipur & Delhi, India
- 4th International Joint Conference on Water Distribution Systems Analysis and Computing and Control in the Water Industry (WDSA/CCWI) – Cyprus
- SIWW2026 Water Convention - Singapore International Water Week (SIWW) 2026 - Singapore
- 17th IEEE Control & System Graduate Research Colloquium – USA
- IEEE International Conference on AI and Data Analytics (ICAD) – USA
- 39th International FLAIRS Conference– Florida, USA
- Computer Vision for Earth Observation Workshop Series – WACV – USA
- Icebumd : 1st International Conference AI, EDGE & BLOCKCHAIN SYSTEMS – 2026 USA
- FLAIRS : The 39th International FLAIRS Conference – 2026 USA
- NASA Lifelines Earth Science Review Board, NASA Lifelines

Reviewer : Journals

- Springer Nature : Discover GeoScience
- Springer Nature : Discover Sustainability
- BHTY
- IEEE
- FLAIRS Journals

Judging, Evaluation Role & Mentor roles

- Smart India Hackathon (SIH)– India
- AI Collective – USA
- Vibe Pitch – USA
- Harrisburg-vibes & n8n – USA
- Business Intelligence Group – USA

- Vibe pitch 7– USA
- Open Hackathons - Mentor & Jury
- Science and Engineering Fair of Houston 2026
- Seattle Startup Summit Workshop Judges 2026
- Review panel NASA F.5 FINESST Earth - Invitation

Membership

- International Society for Photogrammetry and Remote Sensing (ISPRS) – Regular Member
- Institute for Systems and Technologies of Information, Control and Communication (INSTICC) - Regular Member
- GCSAYN Research and Scientific Committee (GRSC) – Core Advisory Group member
- NASA Lifelines Earth Science Review Board, NASA Lifelines

Volunteer

- ESIP
- AGU
- Open Science & Data help Desk

Technical Skills

- **Programming Languages:** Python, R, IDL, MATLAB, Shell Scripting, OpenCV, Pyspark.
- **Artificial Intelligence & Data Science:** Machine Learning, Deep Learning, Time Series Analysis, Predictive Analytics.
- **Statistical Packages:** Python (Pandas data Frame, Scikit, SciPy, NumPy), MATLAB, R-programming, MS Office Excel.
- **Web Services & Data Analytic Dashboard :** Tableau, OBIEE, and other data visualizations using python/R such as Streamlit, Voila, Bokeh, RShiny, Plotly Dash, Greppo & Datashader for geospatial web apps, HTML, Python Django.
- **Remote Sensing and GIS Tools:** ENVI, ArcGIS, QGIS, Rasterio, Shapely, Google Earth Engine(GEE), GeoPandas.
- **Databases:** Microsoft MySQL, Postgres SQL and PostGIS, Oracle and Oracle Spatial, SpatialLite with Sqlite, Redshift, Snowflake, Neo4j for graph and geospatial data, NoSql, Mongo DB and Strong experience with various data formats like JSON, XML, Bitstreams, AVRO, Parquet, and spacecraft data such as Hierarchical Data Format (HDF4), Geotiff, JPEG, TIFF etc.).
- **Cloud knowledge:** Amazon Web services (AWS) Cloud.
- **Web Crawlers in Python:** Rest, Restful, SOAP.
- **Operating System:** UNIX, Linux, AWS EC2 cloud Platform, Windows, Mac and adaptable to any platform.
- **Computation Engine:** DataBricks, SLURM and High-Performance Computing (HPC) machines, AWS Services and cloud-based clusters.
- **Container:** Docker for deployments
- **IDEs for Analytics:** JupyterHUB, Posit Workbench, PyCharm, Anaconda Jupiter Lab, Spyder, Eclipse, Atom, Notepad++, Pydev, PyStudio and Sublime text, ENVI.
- **Documentation:** Excellent documentation with Latex, R markdown and Jupyter Notebook.