

Padam Bahadur Karki

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SUMMARY STATEMENT

A graduate student seeking full time position in scientific data analysis and big data management, innovative data visualizations, machine learning, optical radiometric and geometric calibration, cloud based scientific computing, satellite sensors testing, spatial calibration and characterization, optical remote sensing, operational satellite monitoring, and multispectral and hyperspectral satellite missions using Google cloud platform and Amazon web services.

SKILLS & KNOWLEDGE

Programming/Scripting language: Python, MATLAB, SQL, Java, C, C++, R, SAS

Library/API: Numpy, Scipy, Pandas, Scikit, GDAL, Rasterio, Shapely, TensorFlow, PynlControl, PyTorch, Bokeh, Seaborn, Matplotlib

Software/Tools: MATLAB/Simulink, ArcGIS, QGIS, ENVI, SeaDAS, Git, GitLab, LaTeX, AutoCAD, Google Earth Engine, Allen Bradley - Rockwell Automation Software, Flexisoft HMI design, Proteus, HOMER, High Performance Computing (HPC) Platforms, Amazon web services, Google cloud platform, Adobe Illustrator, Inkscape, PSCAD, CYME, SAM

Datasets: UAV Imagery, Landsat (Multispectral), Sentinel (Multispectral), MODIS (Multispectral), EO-1 Hyperion (Hyperspectral), LiDAR, CIMEL, In-Situ, ASD, Weather Datasets from NREL's SAM software

PROFESSIONAL DEVELOPMENT AND EXPERIENCE

• Graduate Research Assistant, SDSU, USA (Aug. 2021 - present)

- ★ Worked on geospatial data analysis and meaningful visualization using complex multi-dimensional scientific data from Earth observing satellites viz; Landsat, Sentinel, and Hyperion [Python, MATLAB, ArcGIS]
- ★ Worked on the trend analysis of imagery data over Pseudo Invariant Calibration Sites collected from Earth observing satellites for radiometric calibration [Python, MATLAB]
- ★ Scientific data analysis using multi-sensor satellite imagery data to develop top of atmosphere reflectance harmonization algorithm [MATLAB]
- ★ Developed and evaluated a novel dark hyperspectral absolute calibration model with detail analysis and validation using measurement data from different earth observing satellite sensors Landsat-7, Landsat-8, Landsat-9, Sentinel 2A, Sentinel 2B, EO-1 Hyperion, and Moderate Resolution Imaging Spectroradiometer [MATLAB]
- ★ Cross-calibrated different satellites and analyzed using different statistical and time series approach on satellite data; performed uncertainty estimation using Monte Carlo simulation [Python]
- ★ Validated Unmanned Aerial Vehicle with respect to Landsat 8 [MATLAB]
- ★ Achieved and gained a well understanding of geometric distortion, Optical lenses, and noise in optical systems
- ★ Worked on 2D and 3D visualization using LiDAR as a LAS dataset
- ★ Actively engaged in research lab giving both oral and written presentations on research updates on a weekly basis
- ★ Used ArcGIS in surface characteristics visualization with NDVI and shaded relief functions
- ★ Used ArcGIS in making interactive contour map based on geographical elevation for London City
- ★ Worked on Land Surface Temperature (LST) estimation using Landsat-8 images [Python]
- ★ Performed UTM reprojection on MODIS using SeaDAS software
- ★ Worked on testing different forecasting techniques using compared the persistence, perfect, and weather-based solar forecasting techniques using machine learning algorithms [Python]
- ★ Applied AI-based random-forest regressor method to develop and validate dark hyperspectral absolute calibration model [Python]
- ★ Comparison of ARIMA model, SARIMA model, Harmonic model, GARCH model, against the machine learning models for the maximum temperature prediction using the collected real field data from Britton, SD [Python, R]
- ★ Developed and automated method to predict the value of harvest from population cultivation of a single using supervised and semi-supervised machine learning techniques [Python, R]

- ★ Compared KNN and Random Forest Regressor approaches for solar forecasting using weather datasets [Python]
- **Lecturer, Balaju School of Engineering and Technology, Kathmandu** (Oct. 2018 - May, 2021)
 - ★ Conducted theoretical classes on C-programming, Digital Logic, and AutoCAD, and supervised final-year major projects
- **Electrical Engineer, Realtime Automation Pvt. Ltd., Nepal** (Nov. 2018 - July 2019)
 - ★ Developed software for hydropower automation and monitoring system using PLC and SCADA
 - ★ Remote monitoring and Centralized SCADA in cascaded Hydropower
 - ★ SCADA-based control and monitoring system for two cascaded units.
 - ★ Used Internet for communication between the units.
 - ★ Used PLC for logic control of hydropower system.
 - ★ Monitoring and controlling of remote hydropower plants through a centralized SCADA system and RTU i.e. Mobile, Tablets, or Remote PCs.

EDUCATION

- **MS in Image Processing, SDSU, USA** (Expected Graduation: March, 2023)
 - ★ **Advisor:** Mr. Larry Leigh, Director of Image Processing Lab, Ms. Morakot Kaewmane, Imaging Engineer II at SDSU
 - ★ **Thesis Title:** Dark Hyperspectral Absolute Calibration Model Using Dark Extended-PICS on a Global Scale and its Application
 - ★ **Relevant Coursework:** Digital Image Processing, Optical Sensors, Advance Image Processing, Statistical Programming, Remote Sensing Engineering, Statistical Methods, Time Series Analysis
 - ★ **Course Projects:**
 - ★ Detected Lane, School Bus, Stop Sign, and Logo in Images from Traffic *MATLAB, Python*
 - ★ Relative Radiometric Calibration using Histogram Modification Approach to calibrate on-orbit detector response across NIR and SWIR bands of Landsat 7 *MATLAB*
 - ★ Atmospheric Characterization Using CMEL Sunphotometer *MATLAB*
 - ★ Spatial Performance Analysis of Sentinel Image Using Modulation Transfer Function Estimation *MATLAB*
- **BE Electrical Engineering , Pokhara University, Nepal** (2013 - 2017)
 - ★ **Relevant Coursework:** Power System Analysis, Transmission and Distribution Design, Power Electronics, Switchgear and protection, FACT devices, High Voltage Engineering, Control System and Theory
 - ★ **Thesis Title:** Advanced Remote controlled Switch Board
 - ★ **Other Projects:**
 - ★ Designed library management system *C, C++*
 - ★ Line Tracing Robot *C*
 - ★ Earthquake Sensing Device *C*
 - ★ Created e-learning materials for Council for Technical Education and Vocational Training on power station, electrical and electronics engineering material

Diploma in Electronics Engineering , Tribhuvan University, Nepal (2009 - 2012)

- **Relevant Coursework:** Digital Electronics, Digital Communication System, Microprocessor 8085, Microprocessor 8086
- **Thesis Title:** Automatic Night Lamp with Morning Alarm

AWARDS AND ACHIEVEMENTS

- Won third prize in the Hydropower Products and Services Competition (Himalayan Hydro Expo)
- First Position in Line Tracing Robotics Competition
- Sponsored for making Earthquake sensing device from Oxford College of Engineering and Management

PUBLICATION

- J2. **P. Karki**, M. Kaewmane, L. Leigh, “The Development of Dark Hyperspectral Absolute Calibration Model Using Extended Pseudo Invariant Calibration Site at a Global Scale: Dark EPICS-Global”, 2022 (to be submitted).