NIRAJ DHITAL

Department of Physics ◇ Michigan Technological University

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EDUCATION

Ph.D. (Physics)	Michigan Technological University	*2015*
Master of Science (Physics)	Tribhuvan University	*2007*

SUMMARY OF QUALIFICATIONS

- Hands-on experience with data acquisition, statistical inference, regression analysis, predictive analysis, artificial neural networks and Bayesian statistics.
- Knowledge of data mining, artificial intelligence and machine learning.
- Able to formulate solutions to a problem using appropriate analytic, numerical or Monte Carlo approach.
- Worked in a large scientific collaboration (the Pierre Auger collaboration), primarily focusing on analysis of voluminous data.
- Presented results at several collaboration meetings at national and international level.

COMPUTER SKILLS

Languages:	C++, C, Fortran, Matlab/Octave, Python, MySQL.
Operating Systems:	Unix/Linux, MacOS, Windows, DOS.
Data Analysis Packages:	ROOT, R, Auger data analysis package (Auger Offline), Bayesian Analysis Toolkit (BAT), Toolkit for Multivariate Analysis (TMVA).
Mathematical Softwares:	Mathematica, Maple.
Others:	MS Office, LaTeX.

EXPERIENCE

Graduate Research/Teaching Assistant   **Michigan Technological University**

- Search for long-lived weakly interacting particles using the Pierre Auger data.
  Simulated thousands of events in which such particles are produced, obtained distributions for unknown values of simulation parameters from distributions for known parameters (Moment morphing), calculated upper limits on the fraction of such particles in the data.
- Reconstruction of particle production depths from arrival time information.
  Used kernel density estimation (KDE) to obtain the distribution of secondary particles in cosmic ray air showers in the atmosphere using their arrival time information from the detector signals.
- Identification of clouds using GOES satellite data.
  Developed a method to identify night time clouds and obtain cloud probability maps for 3000 km^2 area of the Pierre Auger observatory using data from infrared imagers in GOES-12 and GOES-13 satellites.
- Test of long term performance of detectors.
  Used a nonparametric test to study long term performance of an array of more than 1600 detectors.
- Reconstruction of muon tracks in water Cherenkov detectors.
  Used artificial neural networks for multivariate regression to reconstruct muon tracks in a water Cherenkov detectors.
- Taught several lab sections and a recitation section for undergraduate level physics courses. Maintained and moderated online forum for an undergraduate physics course. Audited lab equipments and chemical inventories for various physics research labs.

Lecturer of Physics   **Gramin Adarsha Multiple Campus, Kathmandu, Nepal**

- Worked as a full time lecturer in physics.
- Moderated students' project works, experiments and presentations.
- Formulated students' aptitude test on various topics of natural sciences.

AWARDS

Miles Fellowship	Physics Department, Michigan Technological University	*2014*
Outstanding Scholarship Award	Michigan Technological University	*2014*

PUBLICATIONS

Link to google scholar page:	`https://scholar.google.com/citations?user=ioKcCbYAAAAJ`