KUNAL KUMAR, Ph.D.

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EDUCATION

- **Northwestern University** **Evanston, USA**
  Ph.D. Physics, Thesis : Considerations in Discovering the Higgs at the Energy Frontier *2006–2012*
- **Indian Institute of Technology Madras** **Chennai, India**
  B.Tech. Mechanical Engineering *2002–2006*

EXPERIENCE

- **Carleton University** **Ottawa, Canada**
  Postdoctoral Research Associate *2012 - 2015*
  - Contributed to 3 physics software packages used globally by ∼5K users through scripting (Python/ Mathematica), bug reports and mathematically intensive calculations.
  - Identified hypotheses that would be extremely difficult to test at the Large Hadron Collider (LHC) experiment, and formulated an analysis (Mathematica/Python) to achieve this by utilizing relative strengths of a proposed experiment.
  - Mentored 3 junior team members via introductions to physics software packages and efficient numerical methods, as well as cross-checks of certain results.
  - Presented my research at 3 international conferences. Co-authored 4 journal publications (112 citations).
- **Northwestern University** **Evanston, USA**
  Graduate student *2006 - 2012*
  - Implemented a multivariate analysis (Python/Mathematica/Bash/Awk) on 100 million rows of simulation data to potentially accelerate the finding of a rare signal at the LHC experiment (running cost ∼ $100 million/month) by ∼4 months (15%).
  - Studied a model that addressed certain anomalous observations and constructed analyses (Mathematica/C++) to potentially find its rare signals at the LHC experiment by 2020.
  - Taught ∼500 undergraduates data analysis and introductory physics courses. Coached ∼30 students beyond office hours to address deficiencies in fundamentals, thereby enabling them to thrive in Northwestern's competitive academic environment.
  - Presented my research at 3 international conferences. Co-authored 5 journal publications (186 citations).

INDEPENDENT PROJECTS

- Exploratory analysis (R/knitr) of San Francisco Crime Data, Model (R/knitr) to classify crimes in San Francisco (Kaggle), Analysis of R's Toothgrowth dataset (R/knitr). For details : http://kkumar84.github.io.

SKILLS

- **Software** : R, Python, SQL, Mathematica, C++, Bash, Awk, Keynote.
- **Analytics** : Exploratory Data Analysis, Hypothesis testing, Maximum likelihood estimation, Regression models, Machine Learning, Time series forecasting.

SELECTED DISTINCTIONS

- Among 150 scientists invited to plan priorities for Higgs research over the next 10 yrs (Seattle,USA) 2013
- Among 60 students chosen globally to attend the TASI physics summer program (Boulder, USA) 2009
- National Innovation Award by President of India 2006
- Indian National Olympiads - Physics (top 0.1%), Chemistry (top 0.2 %), Math & Biology (top 1%) 2002
- Top 0.4% in the IIT Joint Entrance Examination 2002