KUNAL KUMAR, Ph.D.

1-(613)-404-8407 • kkumar@u.northwestern.edu

EDUCATION

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

EXPERIENCE

- **Carleton University** — **Ottawa, Canada**
  Postdoctoral Research Associate — *2012 - present*
  - 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 (101 citations).
- **Northwestern University** — **Evanston, USA**
  Ph.D. Candidate — *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.
  - 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 (178 citations).

SKILLS

- **Software** : Mathematica, R, Python/scikit-learn, SQL, Hadoop ecosystem, Bash, Awk, Keynote, Excel, C++.
- **Analytics** : Regression models, Recommendation engines, Clustering, Time series forecasting, A/B Testing, Maximum likelihood estimation, Monte Carlo simulations, Support Vector Machines, Decision Trees.

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