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| Rishikesh | **Burnaby, BC, Canada**  **+1-425-5891310, rishikes@gmail.com**  **https://github.com/rishikesha** |

### **Expertise**

Algorithms and Data Structues, Machine Learning, Statistical Analyses, Simulation, Optimization, Linear Algebra, Scientific Computing, Stochastic Analysis, Number Theory, Partial Differential Equations, Numerical Solutions of PDE, Numerical Analysis

### Experience **Self Employed/Startup** Software Engineer and Data Scientist Sep 2019 – Mar 2020

* Designed a study to evaluate the value of a SCADA data reporting tool to a large wind power company; suggested how to use SCADA data to improve decision making in operations by using predictive models (Project Proposal)
* GIS consulting: Identified commercial properties satisfying a given set of constraints for the purpose investment (Project Proposal)
* Built a data discovery platform based on the AURUM project  
  https://www.csail.mit.edu/research/aurum-large-scale-data-discovery
  + This can be used to automate identification of relevant data and duplicate data in collections of databases which are typically found in large organizations

### **Verizon,** Principal Engineer, Data June 2019 – Aug 2019

* Identified sites acquired by Verizon, but for some reason they are idle
  + Matched data from operations with the data from lease contracts
  + Used fuzzy matching because of descrepancy in the representation of data in various databases
* Found sites from operation which are not being tracked by the real estate team
* Deployed a service and dashboard to help business users take action to deal with idle sites
* Disposal or repurposing idle sites would save over 10 million dollars in rent payments by Verizon

**Arista Networks**,   
Software Engineer, Routing Team, Vancouver, BC, Canada Apr 2017 – Feb 2018

* MPLS:
  + Programming MPLS routes on the networking chip
  + Debugging distributed systems failure in the MPLS subsystem of the switch
* Implemented a service to program kernel local routes using netlink sockets to make the service fault tolerant
* Implemented parts of MPLS related networking standards (RFCs) for routers
* Programming was done in C++, and the testing framework was written in Python

**Morgan Stanley,** Fixed Income Division, Montreal  
Data Scientist Oct 2014 – Jul 2016

* Conducted daily market share analysis of electronic trading of fixed income products
* Data collection automation, data analysis and visualization of Morgan Stanley’s performance in sovereign bond market
* Daily evaluation of Swap Execution Facilities which jumped into the business on implementation of Dodd-Frank bill
* Built Profit and Loss models for corporate bond trading business
* Implemented numerous statistical and machine learning algorithms in kdb/q: descriptive statistics, linear models, K-means, Kalman filter, dynamic time warping etc.
* Programming done in kdb/q, Java, Python, HTML, Javascript using open source and internally developed libraries. NAG library was used in numerical computations.

**Nomizo Inc**, (defunct startup) Santa Cruz, California Aug 2014 – Oct 2014

Founding Member

* Conducted analyses of computation and data flow in various neural networks including Alexnet for the purpose of implemented them in FPGA
* Compiler to transform caffe neural network model to CUDA functions (similar to tensorflow)

**University of Waterloo**, Dept. Of Elec. Eng., Waterloo, Canada   
Postdoctoral Fellow Jun 2013 – Jun 2014

* Modelled and analyzed bike sharing network as Jackson queues
* Conducted analysis of blocking probabilities (congestion) in parallel queues with various routing schemes
* Simulated queuing networks, and collected data

**Concordia University**, Dept. Of Mathematics and Statistics, Montreal, Canada  
Research Assistant Professor Aug 2013 – Jan 2013

**Univesity of Waterloo**, Pure Mathematics, Waterloo, ON, Canada  
Postdoctoral Fellow Sep 2011 – Jul 2012

* Implemented the algorithm developed during doctoral work using C++, Python, and maple

**University of Bristol**, School of Mathematics, Bristol, UK  
Visiting Postdoctoral Fellow Jun 2011 – Sep 2011

* Explored the zeros of Elliptic Curve L-functions.
* Conducted extensive computational experiments using a cluster
* Designed a protocol for communication between master and worker processes
* Analyzed the data produced by these experiments

**Mathematical Sciences Research Institute**, Berkeley, CA, USA  
Research Member Jan 2011 – May 2011

* Worked on LMFDB, a project concerning identifying, collecting, and organizing data useful for researchers in Mathematics [http://www.lmfdb.org](http://www.lmfdb.org/)
* Identified commonly occurring programming patterns during out research, and wrote a Python module to abstract them out, resulting in increased productivity and reduced code duplication

**University of Waterloo**, Pure Mathematics, Waterloo, ON, Canada  
Part time programmer, Focussed Research Grant Project Jun 2008 – Dec 2010

* Contributed to lcalc, a library for computing certain number theoretic functions
* Using lcalc library, contibuted a Python module to sage ([http://www.sagemath.org](http://www.sagemath.org/)) which computes the same number theoretic functions, which is now extensively used in LMFDB
* Wrote documentation and trained others in the project to use aforementioned software

Graduate Teaching Assistant 2006 – 2010

### Software Projects in Research

* LMFDB, a RESTful web application ([http://www.lmfdb.org](http://www.lmfdb.org/))
  + Designed and implemented backend functions to compute the values of L-functions on the critical line
  + Designed and implemented functions to compute symmetric power L-functions
* Lcalc and SAGE ([http://www.sagemath.org](http://www.sagemath.org/))
  + Designed and implemented library version of Lcalc
  + Designed a python interface to the Lcalc library, and contributed it to SAGE
* Designed distributed computational experiment using twisted ([http://twistedmatrix.com](http://twistedmatrix.com/))
  + Designed a fault tolerant protocol to distribute large scale computation of Elliptic Curve L-functions in a cluster

### Education

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| University of Waterloo, Waterloo, Canada | Ph.D Pure Mathematics |
| Ohio State University, Columbus, OH, USA | M.S. Mathematics |
| Indian Institute of Technology, Kanpur, India | B. Tech Electrical Engineering |

**Technical Expertise**

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| Programming Languages | Python, C++, Julia, Java, Bash, Scala, Javascript, Ocaml |
| Cloud Platforms | Docker |
| Web Services | REST API ( Python Flask ) |
| CI/CD, configuration management, Version control | Subversion, Jenkins, Git, Bitbucket, Github, Gitlab, Jira |