Karan N. Shah

CONTACT INFORMATION

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EDUCATION

Georgia Institute of Technology, Atlanta, Georgia USA **Expected May 2018**

B.S., Computer Science (Intelligence and Modeling-Simulation Threads)
B.S., Physics
Thesis: *"Analysis of Uncertainty in Machine Learned Density Functionals"*
Advisor: Dr. Andrew Medford

RESEARCH EXPERIENCE

Lawrence Livermore National Laboratory, Livermore, CA USA

Technical Scholar, Physics Division (50% Lab Employee, Full Time Student) **Aug 2017 - present**
Intern, Data Science Summer Institute **May 2017 - Aug 2017**
Advisor: Dr. Michael Schneider
Project: Hierarchical Probabilistic Inference of Cosmic Shear & Intrinsic Galaxy Properties
Used MCMC techniques to determine posterior distributions of galaxy properties

Georgia Institute of Technology, Atlanta, GA USA

Medford Group, School of Chemical & Biomolecular Engineering **Jan 2017 - present**
Advisor: Dr. Andrew Medford
Project: Determination of Exchange Correlation Functionals through Deep Learning
Uncertainty quantification of machine learned density functionals using bootstrap aggregation of weak neural networks

Otte Lab, Center for Relativistic Astrophysics **Jan 2016 - present**
Advisor: Dr. A. Nepomuk Otte
Project: Segmented Schwarzschild-Couder Telescope Model for GrOptics ray tracing package
Added telescope model to GrOptics, written in C++(with CERN ROOT)

Data Driven Education Group, Center for 21st Century Universities **Aug 2015 - present**
Advisor: Dr. Robert Kadel, Dr. Amanda Madden
Project: Inferring student success predictors from Georgia Tech MOOC data

Wolfram Research, Boston, MA USA

Wolfram Mentorship Program **Nov 2016 - Jan 2017**
Wolfram Summer School **June 2016- July 2016**
Advisors: Dr. Giorgia Fortuna, Dr. Todd Rowland
Project: Classifying Cellular Automata using Machine Learning

HONORS AND AWARDS

- Datmo Applied Machine Learning Fellowship, December 2017
- Amazon Web Services Research Grant ($8000), September 2017 (Advisor: Dr. Madden)
- President's Undergraduate Research Award:
  Fall 2017 (Advisor: Dr. Medford, declined due to LLNL appointment)
  Fall 2016 (Advisor: Dr. Otte)
- Fellow, Data Science Summer Institute, LLNL, Summer 2017
- Student Travel Awards: JupyterCon 2017 (NYC), WSSSPE 2016 (Manchester, UK)
- Top 10 percentile in Indian National Astronomy Olympiad, 2012

Memberships

Large Synoptic Survey Telescope Dark Energy Science Collaboration
Cherenkov Telescope Array Consortium
American Physical Society
Society for Industrial and Applied Mathematics

Computer Skills

Python, C++, Mathematica, Matlab, LaTeX, HTML/CSS, Arduino Processing

Research Products

Hierarchical Bayesian Modeling
Link:www.github.com/karanprime/CosmicMCMC

Machine Learning approaches to Density Functional Theory
Link: www.github.com/karanprime/surrogate_functionals

GrOptics Telescope Package
Link: www.github.com/groptics/GrOptics (branch "karan")

Cellular Automata Classification through Machine Learning
Link:www.github.com/karanprime/mlforca

Selected Academic Projects

Modeling human migration as an N-body problem (For CX 4230 Simulations)
Link: www.github.com/karanprime/MigrationSimulator

Cellular Automata Simulator (For PHYS 3226 Computation Physics)
Link: www.github.com/karanprime/Cellular-Automata-Project

Sunset Observation Project (For PHYS 2021 The Solar System)
Link: www.karan.sh/projects/sunset

Laboratory Data Analysis and Writing Samples (PHYS 4321 Advanced Lab)
Link: www.karan.sh/projects/advlab

Supplemental Experience

Analyst and Developer, Cryptomen.com - Startup **July 2014 - Feb 2015**
Part of a five-person startup that raised $47,000 in cryptocurrency investment.
Contributed to a program for trading cryptocurrencies online, wrote articles about blockchain and other cryptocurrencies for the company blog

Student Assistant, Center for Non Linear Science, GT **Jan 2015 - Aug 2015**
Supervisor: Dr. Predrag Cvitanovic
Assisted Dr. Cvitanovic in producing video lectures and maintaining website for a MOOC on chaos theory (Link: http://chaosbook.org)

Outreach and Leadership

Co-founder, Bitcoin@Tech, Georgia Tech's Bitcoin Club **Aug 2014 - May 2015**
Started Georgia Tech's first Bitcoin club. Conducted workshops on Blockchain technology & organized events in collaboration with organizations such as Bitpay and Atlanta Bitcoin Meetup.

E-Text Production Assistant, Alternate Media Access Center, GT **Mar 2014 - Mar 2015**
Converted textbooks and other technical literature to formats readable by text-to-speech accessibility software.

Various volunteering roles: Maker Faire Atlanta, Lego First Robotics competitions etc.

Misc

Responsible Conduct of Research Stage 1 Certificate, CITI, License 15693882