

## Contact

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(LinkedIn)  
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## Top Skills

Python  
Machine Learning  
Data Science

## Languages

English (Native or Bilingual)  
Hindi (Native or Bilingual)

## Certifications

Bayesian Statistics: From Concept to Data Analysis  
Principles of Computing (Part 1)  
Algorithmic Thinking (Part 1)  
Probabilistic Graphical Models Specialization  
Bayesian Methods for Machine Learning

## Publications

Particle Zeta Potentials Remain Finite in Saturated Salt Solutions  
Origins of concentration gradients for diffusiophoresis  
Boundaries can steer active Janus spheres

## Patents

Non-UV high hardness low k film deposition

# Astha Garg, Ph.D.

Principal Data Scientist | Deep Learning | Time Series  
Singapore

## Summary

I love discovering, decoding and retelling the stories that data tells. I wield powerful tools such as statistics, machine learning and deep learning to solve important problems encountered in research and production in the semiconductor, materials, chemicals and pharmaceuticals industries.

I place solving problems and improving productivity at the center, which means I care not just about the latest algorithms, but also about the most appropriate approach for the problem.

My passion for data is what drove me to go from being a PhD in Chemical Engineering to a Data Scientist at Citrine Informatics, helping companies speed up materials design using machine learning. At Chord X, our team is creating smart solutions to reduce downtime and emissions of marine engines.

My research interests include anomaly detection for industry 4.0, uncertainty quantification and working with less data.

Some characteristics set these problems apart from mainstream data science problems, such as those encountered in retail or advertising:

- \* small datasets,
- \* the presence of decades of domain expertise
- \* the necessity of building confidence in a model.

As a Scientist dedicated to solving these problems, I fuse my diverse experiences as a Data Scientist, Formulation Scientist (during PhD) and Process Engineer (at Applied Materials) with cutting edge research in field of AI to provide practicable, robust and insightful solutions.

Outside of work, I love dancing and spreading the joy by teaching Bombay Jam; and getting back to my roots as a Chemical Engineer - by experimenting with food in my kitchen :)

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## Experience

### Chord X

Principal Data Scientist

December 2020 - Present (4 months)

Singapore

Institute of Infocomm Research, A\*STAR - Agency for Science, Technology and Research

Machine Learning Researcher

September 2019 - December 2020 (1 year 4 months)

Singapore

I am currently researching deep learning algorithms for anomaly detection in industrial time-series, and developing approaches for data-driven experimental design for data coming from heterogeneous sources, to solve problems encountered in manufacturing and RnD in the chemicals, materials, pharmaceuticals industries.

Keywords: time-series analysis, deep learning, uncertainty quantification, bayesian optimization.

### Citrine Informatics

Data Scientist

May 2018 - July 2019 (1 year 3 months)

San Francisco Bay Area

Worked with top chemicals and materials companies in the US and Europe to accelerate materials design using machine learning, showing tangible results. In one of the projects I led, we leveraged machine learning combined with domain knowledge to narrow down a search space of over 10,000 candidates to <100 promising candidates. In just 18 weeks, more than 25% of the candidates we identified were experimentally shown to beat the best observed over years of research.

### Applied Materials

Process Engineer 3

May 2017 - May 2018 (1 year 1 month)

## San Francisco Bay Area

Worked on improving the productivity of Chemical Vapor Deposition process by reducing defects, improving uniformity and film properties through data analysis and design of experiments.

## Penn State University

### Graduate Student

August 2012 - April 2017 (4 years 9 months)

State College, Pennsylvania Area

Thesis Advisor : Prof Darrell Velegol

Thesis title : Measurement Of Colloid Transport - From Micromotors To Geo-Reservoirs

As part of my thesis work, I made the first ever measurements of charge (zeta potential) on microscopic colloidal particles at saturated salt concentrations. The signal to noise ratio for these measurements was enhanced by extracting the response of sinusoidal electric fields using fourier transforms. In this project I automated the acquisition of over 200 videos and the analysis of data from over 2 million images.

Through these, and other conventional means such as electron microscopy I have gained insights into the nano- and micro-scale behavior of colloidal particles and fluid flows.

### Collaborations

I have collaborated with many groups at Penn State and outside, working on my thesis project. Some of these groups include Prof. Ayusman Sen (Chemistry), Prof. Kyle Bishop (Chem Engg) and Prof. Christopher Gorski (Civil Engg).

## BASF

### Research Intern

October 2011 - April 2012 (7 months)

Modeling and simulation of a distillation column in FORTRAN for optimal mass transfer.

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## Education

### Penn State University

Doctor of Philosophy (Ph.D.), Chemical Engineering · (2012 - 2017)

Indian Institute of Technology, Bombay

Bachelor of Technology (B.Tech.), Chemical Engineering · (2007 - 2011)

J. H. Ambani School

Matriculation · (1995 - 2005)