

## Contact

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## Top Skills

Data Science

Software Development

Google Cloud Platform (GCP)

# Zhen Dai

Senior Machine Learning Engineer, Wayfair  
Cambridge, Massachusetts, United States

## Experience

### Wayfair

Senior Machine Learning Engineer

November 2020 - Present (2 years 6 months)

Boston, Massachusetts, United States

- Researched, developed, AB tested, and deployed to product the Time Informed Calibration Python package, which uses time series models to improve the predictions of probabilistic and regression models.
- Developed software, applications, and AB tests for the Share of Voice platform, which uses optimization algorithms to balance marketing spends between established and emerging product categories.
- Led the integration of workflows between the SWE and DS teams to produce a model auto-retraining platform.
- Collaborated with engineering and analytics teams to develop an application that identifies potential new customers using natural language processing, XGB, and neural network models
- Supported team product discovery and software development efforts leveraging technologies including Google Cloud (including Google Bigquery), Hive, Spark, Airflow, Mamba

### Harvard University

Research Assistant

August 2015 - November 2020 (5 years 4 months)

Cambridge, MA

- Analyzed regional impacts of solar geoengineering using machine-learning and statistical methods to optimize design of aerosol injection strategies
- Interviewed top climate scientists and policy makers in China and the US to compare views towards geoengineering. Analyzed interview scripts using natural language processing methods to identify beliefs.
- Analyzed impacts of LEED standards on building energy use in 10 US cities using statistical and ML methods
- Conducted lab studies and built box models on chemistry of solar geoengineering related to ozone loss

### Wayfair

## Data Scientist

May 2019 - August 2019 (4 months)

Greater Boston Area

Collaborated with engineering and analytics teams to develop models that identify potential new customers

Improved existing customer-needs model performance by developing features in Hadoop and Spark

Developed machine learning models to evaluate the effectiveness of third-party dataset (billions of rows daily) to improve customer targeting in marketing campaigns

## Eden Group, UIUC

Research Assistant

August 2013 - May 2015 (1 year 10 months)

- Introduced reactive gas in microcavity plasma devices to generate chemical fuels
- Characterized reaction products with mass spectrometry and IR spectrometry

## GLOBALFOUNDRIES

Process Engineer

July 2012 - August 2013 (1 year 2 months)

Malta, NY

- Developed an optical dopant measurement method for 14nm and 20nm EPI processes
- Managed and developed measurement models for optical ellipsometry tools
- Developed and managed lithography process window qualification projects
- Managed SPC-coordinated sampling projects with one other colleague

## Spilvenger Project Team

Team Leader

October 2011 - May 2012 (8 months)

Led a team of 5 students to develop an oil spill cleanup machine. Simulated chemical and energy transfer schemes in SOFCs. Designed and constructed an on-board crude oil purification prototype. Organized meetings with industrial and faculty members for project consultation.

## Thompson Group&Hanrath Group, Cornell University

Research Assistant

February 2010 - May 2012 (2 years 4 months)

Conducted research on improving nanoparticle electron transfer efficiencies with transient pulsed laser annealing for solar cell applications in joint with Hanrath group

Fabricated micro fluidic devices in CNF Cleanroom to test microliter scale of NIMs

Constructed machinery for testing NIMs thermo conductivity with the 3 $\omega$  method

Developed ZnO Electrophoresis deposition scheme to produce fully dense thin film with thickness of 50-100nm as thin film transistor substrate

Calibrated CO<sub>2</sub> laser power by measuring varying resistance of platinum thermistors

Wrote programs in Genplot and Matlab to control CO<sub>2</sub> laser and analyze calibration data

Programmed and controlled CO<sub>2</sub> laser system to test beam heating power

#### Pfizer

Summer Intern, Research Assistant

May 2011 - August 2011 (4 months)

Groton, Connecticut

Researched and determined drug degradation rate as a function of dilution, particle size, time, and temperature by monitoring degradant concentrations with HPLC

Developed computational model in Matlab to simulate drug-excipient surface interaction

#### ChemE Car Project Team

Fuel Cell Team Member

September 2010 - May 2011 (9 months)

Investigated viability of fuel cells in the team's old car

Designed and manufactured fuel cells for a new car to enter competitions in 2010 and 2011

Calibrated car stopping positions to meet competition requirements

Team won first place in 2011 national competition.

#### Cornell University

Matlab Consultant

September 2010 - December 2010 (4 months)

Provided academic assistance to students in Matlab courses as a TA in section and as a Consultant in computer lab. Graded student homework and exams with department staff.

Ober Group, Cornell University

Research Assistant

April 2009 - March 2010 (1 year)

Designed and implemented experiments on improving the ordering of block copolymers on thin films with solvent annealing for photolithographic use

Operated AFM, x-ray diffraction and laser reflection tools to monitor ordering properties

Generalized optimal annealing solvent composition as a function of solvent and polymer hydrophobicity, copolymer composition, and block masses

Researched graphoepitaxy and homopolymer mixing as alternative ordering methods

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## Education

University of Illinois at Urbana-Champaign

Master's degree, Electrical and Electronics Engineering · (2013 - 2015)

Cornell University

Bachelor's, Materials Science and Engineering, Chemistry · (2008 - 2012)

Harvard University

Doctor of Philosophy - PhD, Environmental Science

University of Illinois at Urbana-Champaign