# ZIXUAN (SUNNY) DENG

**4th Year Mathematics Undergraduate**

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## EDUCATION

**Honours Bachelors of Arts, Mathematics, Concentration in Statistics**

**Wilfrid Laurier University**

📅 Sept 2016 – 2020     📍 Waterloo, ON

## PROJECTS

### Prediction of Extreme Weather Events using Statistical Learning Techniques (Research Project)

📅 Sep 2019 – April 2020

- Analyzed the pattern of weather dataset in R using various methods such as Supervised Learning and Time Series Analysis to predict future extreme weather events. Implement Logistic regression, LDA, QDA, Decision Tree, Random Forest predictive model.
- Preprocessed the data to remove outliers and handle missing value by using Multiple Imputation. Selected features and solved class imbalance by over-sampling technique.
- Evaluated the model and used Cross Validation, reached approximately 95 percentage accuracy.

Technologies used: R Studio, Caret, Rpart, Mice.

### Perception Toolkits

📅 Jan 2020 – March 2020

- Implemented perception with sigmoid function from scratch to perform binary classification on any linearly separable dataset.
- Utilized negative log likelihood and gradient descent to achieve the same score as sklearn open source.
- Implemented perception with identity function from scratch to perform linear regression on real time stock price.
- Preprocessed the dataset and fine-tuned the model to achieve lower inference error

Technologies used: Python, Sklearn, Matplotlib, Pandas, Numpy.

### Competitve Pricing Strategy for SMBs On e-Commerce Platform

📅 Sep 2019 – Dec 2019

- Implement regression predictive model in python to optimize item prices for small-medium e-commerce businesses based on Amazon product metadata and review data.
- Preprocessed the data to remove outliers and normalize by scale. Fine tuned learning hypter-parameters by analyzing train and test cost.

Technologies used: Python, Sklearn, Matplotlib, Pandas, Numpy.

### SQL Tool for Movie Sales Report

📅 May 2019 – June 2019

- Queried data from database by using advanced SQL skills, created monthly reports to monitor 1000 products' sales performance for each store location.
- Designed and developed inventory reports to track and monitor product availability at each store; provided organized data to support business decisions on replenishment strategies.

Technologies used: MySQL, Select, Case, Group by, Left Join, Inner Join.

## SKILLS

**Languages**

R   Python   Tableau   SQL   SAS   VBA

**Tools**

Jupyter Notebook   R Markdown   MySQL   Oracle   Power BI   Tableau   Sklearn   Pandas   Numpy   Matplotlib

**Related Coursework**

- Monte Carlo Simulations
- Time Series Analysis
- Statistical Learning
- Windows Application Programming

## EXTRA-CURRICULAR

### Treasurer

**Breaking Barriers: Cross Cultural Mental Health Club**

📅 Jan 2019 – Aug 2019

- Created budgets for future club activities, streamlined monthly closing operations to increase efficiency, and completed financial due diligence.

### Volunteer

**Breaking Barriers: Cross Cultural Mental Health Club**

📅 Sep 2018 – Aug 2019

- Wrote and uploaded quality posts on the public platform(eg.Wechat). Designed posters for club advertising.
- Collaborated with other volunteers to discuss new fundraising opportunities.

### Math Tutoring Volunteer

**JUMP Math**

📅 Sep 2017–Nov 2017

- Led groups of children in discovery exercises and offered personalized support in need of extra math help.

## OTHER INTERESTS

Volleyball   Philosophy   Skiing   Ukulele   Classical Music