

# Patrick Herlihy, PE

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## Education

University of Delaware Newark, DE

*Bachelor of Civil Engineering* (May 2015)

Study Abroad: Australia, winter 2014

Western Governors University

*Master of Science Data Analytics* (Feb 2023)

## Projects

### **Hospital Analytics**

- Data Acquisition, imported customer/survey data to Postgre SQL from various sources and prepared queries to join, sum, and analyze customer feedback for various service providers.
- Provided data cleaning for hospital data using Python, removed duplicates, imputed missing values where applicable, and performed principle component analysis to reduce/better understand the data.
- Exploratory Data Analysis, prepared one way and two way ANOVA analysis to determine correlations within the hospitals dataset. Prepared univariate and bivariate visualizations using Seaborn and Plotnine packages to explain the trends discovered.
- Prepared predictive analysis in Python, performed linear and logistic regression to build predictive models to better estimate customer costs and the likelihood of readmission for customers.
- Prepared KNN classification, Random Forest Regression models with hyperparameter tuning to build prediction models for various variables within the hospitals data.
- Created mySQL databases, ran queries to aggregate/summarize data, and connected to Tableau to create dashboards to present my findings.

### **Market Basket Analysis - Sales Analysis**

- Cleaned and prepared historical customer data containing over 7500 entries.
- Prepared Market Basket analysis using the Apriori algorithm to develop a recommender system to help improve sales.

### **San Diego AirBnB Analysis - Pricing Tool**

- Cleaned and explored over 14000 entries of Airbnb housing data.
- Utilized multiple linear regression to develop a pricing tool to accurately price a rental property in San Diego based on location, house amenities, and number of people it can accommodate.

## Experience

### **Jefferson County Transportation & Engineering**

Golden, CO

*Civil Engineer*

(July 2021 – June 2022)

- Obtained historical site and rainfall data, provided predictive analysis, and technical reports for culvert crossing & safety projects throughout Jefferson County.
- Inspected culverts with the construction unit to update pipe database and identify pipes for replacement based on prior failing culvert data.
- Prepared grants to acquire project funding from various entities.
- Worked as a liaison between the public and the construction unit presenting findings before work was set to begin.

**Harris Kocher Smith**

Denver, CO

**Water Resources Design Engineer III**

(October 2019 – July 2021)

- Obtained historical rainfall and soil data, and prepared stormwater and drainage predictive models for land development projects all throughout Colorado & Utah.
- Optimized the sizing and outlet design of detention ponds using CUHP, SWMM, and MHFD Detention for onsite water quality.
- Prepared preliminary and final drainage/stormwater technical reports utilizing visualizations in support of the land development projects.
- Assembled plans for onsite water quality facilities such as extended detention basins and water quality detention vaults.
- Attended design review meetings and coordinated with clients on completing deliverables.

**Jacobs Engineering**

Philadelphia, PA

**Highway Design Engineer/Project Engineer – Water/Wastewater**

(May 2017 – September 2019)

- Using historical site data, assembled design calculations for swale capacity, channel lining, stormwater analysis/design, spread analysis, pipe sizing, and riprap apron design for PennDOT projects.
- Researched scope of work, reviewed standards, and assembled full drainage and stormwater design reports, documenting findings for Nevada DOT projects.
- Reviewed vehicle crash data, provided exploratory reports along PennDOT roadways to identify clusters of high risk, and prepared predictive models with alternative solutions to mitigate the high crash volumes.
- Developed macros that communicated with microstation sheet files to automate sheet creation, numbering, and labeling using visual basic.
- Developed design plans for Philadelphia Water projects involving green stormwater infrastructure, baseplans, water & wastewater, ADA ramps, and roadway grading.

**Telecom Coordinator**

(November 2015 - May 2017)

- Reviewed construction drawings, created initial bill of materials, and developed scope of work to be done for upgrading over 200 AT&T LTE sites.
- Managed and updated project database for over 600 ongoing projects at a time.
- Worked with structural engineering team on analysis of antenna mounts and design of mount modifications.
- Developed visual basic macros to mass produce status reports, and automate workflows, relieving coworkers and managers from hours of tedious work.

**Skills**

- Python, Microsoft excel, SQL, R, Tableau, PowerBI, Microstation Inroads & OpenRoads, AutoCAD Civil 3D, Synchro, pySWMM, Hec-HMS, Hec-RAS, Java, and Visual Basic (VBA).

**Affiliations**

- Philadelphia & Colorado AWRA

References Available Upon Request