# Michael Willy, Data Engineer

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- Develops analytical models with Python & SQL to deliver global research data and metadata inference
- Automates models on high-dimensional data into databases consumed by notebook and dashboard interfaces
- Holds over five years of experience developing data projects across diverse internal organizations and virtual compute platforms

## Tools

Python (Polars SQL, Pandas, NumPy, Scikit-Learn, SQLAlchemy, Plotly), Git, Power BI, LaTeX
SQL (Oracle, MS SQL, SQLite), Amazon AWS S3, Bash & PowerShell, Cron, Airflow, Docker, Markdown

## Experience

(1) **Data Engineer Applications**, Research Chemical Company 2023
- Operation and data automation of corporate R&D Electronic Lab Notebook (ELN)
- SQL accuracy validation for migrations, partitioning updates, and data sanitization for developers
- Build automated Python Polars SQL-context csv report generation on Linux & Microsoft platforms
- SQL & Python LDAP and regex reports for user patterns presented in Power BI visual dashboards

(2) **Data Science & Engineer**, Research Chemical Company 2020
- Developed Python & SQL pipelines to extract lab documents transformed into database model
- Built Fast Fourier Transform (FFT) analysis & plotting pipeline command line and notebook interface
- Built visualization with Dash Plotly, Jupyter Notebooks, and Microsoft Power BI to create a process visualization valued by another vendor as a $300k quote

(3) **Pilot Project Engineer**, Research Chemical Company 2018
- Integrated and automated time series and part wise database reporting using SQL & Python on virtual plant environment
- Designed machine user interfaces, instrumentation, and the data model for a new lab factory
- Managed contract equipment installation and start up for nine pilot machines valued at $800k capital

(4) **Research Engineer**, Research Chemical Company 2014
- Scaled-up organic light emitting diode (OLED) purification and programmed robotic device fab

(5) **Application Engineer**, Semiconductor Manufacturing Company 2012
- Scaled-up manufacturing and develop metrology applications for chemical vapor deposition diamond

## Work Projects

(1) Fast Fourier Transform Numpy & SciPy signal processing automation with Plotly dashboard, JSON API, and runtime SQLite database
(2) Developed a graph Euclidian distance semi-supervised machine learning model to estimate profiles from process inputs trained on semiconductor wafers
(3) Data pipeline from distributed labs with regular expression file tree search. User view into database was PHP site producing a parameterized SQL report via a command line Python API.

## Education

M.S. Applied & Computational Mathematics, University of Washington, Seattle, WA December 2023
B.S. Chemical Engineering, Minor in Mathematics, Drexel University, Philadelphia, PA 2011

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