ANNIE ERBSEN

Data Scientist

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SUMMARY

I am a results-oriented data science professional with a solid foundation in physics, enriched by extensive experience in business strategy, analytics, and marketing. My expertise in data science was further advanced through a rigorous 14-month data science bootcamp, emphasizing machine learning and advanced analytics. Known for my creativity and logical approach, I excel in identifying key questions and leveraging strategic insights to drive data-informed business decisions.

SKILLS

Programming Languages: Python (Pandas, NumPy, Scikit-learn, TensorFlow, Keras etc.), SQL, MATLAB, HTML & CSS
Tools & Skills: Business Strategy, Machine Learning (supervised & unsupervised), Time Series Analysis and Forecasting, Data Cleaning & Wrangling, Feature Engineering, Data Storytelling, Technical Reports and Presentations, Statistics, Marketing & Advertising, Marketing Strategy, Neural Networks, Deep Learning, Data Visualization, Hadoop, PySpark, Tableau, Snowflake, AWS, UNIX, Linux, Excel, GitHub

RELEVANT PROJECTS

Predicting Customer Spending Patterns Aug 2023 – Dec 2023

- Analyzed customer spending habits at a major retailer, determined which marketing campaigns were most effective, made time series forecasts, developed XGBoost regression and classification models to predict customer spending and coupon use based on customer demographics and determined which features contributed towards customer spending and coupon use behaviors.

Predicting Survival Outcomes Utilizing Breast Cancer Gene Expressions Jan 2023 – July 2023

- Used the METABRIC gene expression data to develop model to predict if a patient will die of disease with 81% recall and identified gene expressions contribute towards breast cancer survival outcomes.
- Compared supervised machine learning models, including Logistic Regression, Random Forest, XGBoost and LGBM classifier. Developed pipeline to predict patient death with 81% recall & quantify gene expression contribution towards outcomes.

Liver Cancer Treatment Predictions from Tc-99 Microspheres Aug 2005 – June 2006

- Successfully created a model in MATLAB to predict dose distributions with therapeutic treatment of liver cancer with Y-90 from SPECT scans of Tc-99m microsphere dummy treatment. Built 3D convolution integral from scratch, and my program was used to cross-validate results from Wake Medical Center in Raleigh, NC as a part of their clinical trial.

EDUCATION

Springboard Data Science Career Track Bootcamp Oct 2022 – Jan 2024

Certification

Included: Python, SQL, statistics/statistical programming, data cleaning & wrangling, exploratory data analysis, machine learning, modeling, visualizations, time series analysis and forecasting, neural networks, deep learning, 3 hands-on capstone projects. Over 600 hours of course material & mentoring with an industry professional.

University of Kentucky

Coursework & clinical rotations completed towards MS in Radiological Medical Physics Aug 2007 – Dec 2009

Included: Clinical rotations in radiation oncology, statistics, anatomy & physiology, oncology, interaction with radiation with matter, radiation dosimetry, radiation safety/health physics (included working with radiation sensors), nuclear medicine, diagnostic imaging, brachytherapy, radiation treatment planning.

Guilford College Aug. 2002 – June 2006

BS in Physics, Concentration in Mathematics

Included: Medical physics honors thesis, mathematical physics, calculus 1, 2 & 3, partial differential equations, statistics, electricity & magnetism, quantum mechanics, classical & modern physics, nuclear physics, experimental physics, medical physics internship.

EMPLOYMENT

Native Ground Books & Music, *Data Analytics & Marketing Lead*, Asheville, NC Feb 2014 – Dec 2023

- Oversaw and optimized operations, fostered a collaborative and effective team of employees, and increased revenue by over 10% within 2 years.
- Lead the strategic analytics efforts: performed data analytics on sales, promotions, ad channels and inventory to develop new titles, cut costs, find new lines of business and predicted future sales trends & inventory needs with time series forecasting.
- Developed eBook division, coded all of the books using HTML, and created a pipeline to streamline processes. Several of the books became #1 Amazon best-sellers.

Fleur de Lune, *Owner/Founder*, Charvensod, Italy Jan 2011 – June 2014

- Business focused on artisan soap & natural body care products. Within 1 year became one of the most popular natural cosmetic brands in Italy.
- Using background in chemistry & biology, formulated & tested all products. Responsible for technical documentation and laboratory design/maintenance. Did all web design, marketing, business analytics, production, research and bookkeeping.

Hôpital Régional Umberto Parini, *Medical Physicist*, short term contract. Aosta, Italy March 2010 – Oct 2010

- Created radiation treatment models & performed quality assurance and radiation safety checks of the Tomotherapy unit.
- Contributed towards breast cancer clinical research by comparing outcomes from different treatment modalities using radiologic data.

Wake Medical Center, *Radiation Physics Intern/Research Assistant*, Raleigh, NC Aug 2005 – June 2006

- Worked with the medical physics, nuclear medicine and oncology teams on a liver cancer clinical research trial, where Tc-99m microspheres were injected into the liver as a 'dummy treatment', scanned using SPEC, with the goal of using those images to predict dose distributions for the therapeutic treatment usingY-90 implants. Using this methodology, the team could see if the treatment would be safe and effective for individual patients.
- My part of the project involved shadowing the medical physicists in the hospital, assisting with radiation safety checks using sensors, and I created a model in MATLAB to confirm the dose calculations of the new treatment method that they were using. I created a 3D convolution integral to predict the therapeutic Y-90 dose distribution based upon radiologic data from the nuclear scans. I was able to successfully model the dose distribution, and my program confirmed their calculations.

Oak Ridge National Lab/University of Tennessee, *Physics Internship*, Oak Ridge, TN May 2004 – Aug 2004

- Summer internship in the Surface Science division of Oak Ridge National Laboratory.
- Used an Atomic Force Microscope to study quantum dots and atomic layers on different substrates.
- Collected measurements, wrote reports and regularly presented findings.

College of Wooster, *Physics Internship*, Wooster, OH May 2003 – Aug 2003

- Summer internship in the physics department of the College of Wooster.
- Used an atomic force microscope to study and categorize quantum dots, wrote a technical instruction manual on the use of the atomic force microscope and research methodologies, wrote technical reports and presented findings to my advisors.
- Presented my findings at the 2004 annual meeting of the American Physical Society in Los Angeles, CA.