Sr. Innovation Engineer - Boise Cascade

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- **Research:** Anomaly Detection in Temporal Data, Dimensionality Reduction for Big Plant Data, Reinforced Learning for Manufacturing Systems

I am an experienced production and technical manager turned engineer and data scientist with a demonstrated success in manufacturing and a love for data science.

My adventures in data science began nearly 30 years ago when I got my hands on a sweet 80486DX PC with a 50Mhz processor. The PC coupled with a command prompt and a MS-DOS batch file led to many years or exploration with iteration control structures. I found myself fascinated with numerical methods where I could leverage my understanding of iteration to solve complex math problems. One of my favorites was Euler's method.

After undergraduate studies in Mathematics at La. Tech, I found my way into satellite broadband communications for nearly a decade holding a myriad of positions across the country for DirectTV and Dish Network. In this work, I learned about the value of working with my hands and head together.

In 2014, with a goal of moving home to Louisiana to be closer to my children, I restarted my career as a "broom engineer" at Boise Cascade in a LVL manufacturing plant in central Louisiana. After proving myself as the best floor sweeper west of the Mississippi River, I was promoted to Production Supervisor where I grew a small department responsible for making LVL billets by way of finger-jointing into a cost effective, record-breaking production machine. I did it by leveraging data analytics to make decisions based on data and not emotion.

After leadership understood that I was a statistics and programming guy, I was promoted into a technical leadership role for the region overseeing 3 facilities and a team of quality control technicians with multiple responsibilities to include the quality control program for the region, customer claims and investigations, and cost reduction initiatives across the facilities.

I went back to college on nights and weekends and earned a degree in Business through company sponsorship.

I was promoted again into a Production Superintendent role overseeing LVL and I-Joist assembly near my hometown. Through my tenacity and expertise in SQL, JavaScript, Power BI, and Excel, and a group of very hard-working employees, we were able to significantly improve the cost structure of the machine center by leveraging statistics to optimize product flow and logistics with eventual production and quality records on all products.

Within a year I was promoted again to oversee veneer preparation and billet manufacturing. Again, I leveraged my passion for Data Science to drive decisions using prediction with prescription over reaction and chaos. I created multiple back and front-end applications to help front line supervisors and operators make better decisions faster using SQL, Power BI, and HTML/CSS/JavaScript.

In 2019, I was offered a plant management position in an old plywood mill in southwestern Louisiana. Through my tenure there, I improved countless systems using advanced analytics to include downtime prediction, preventative maintenance optimization, machine vision optimization, statistical process control on plant KPI's, environmental compliance, and many more. However, my biggest contribution to this plant was to the 15 supervisors and superintendents that reported to me whereby I had the opportunity to show case the magic of Data Science for Business Intelligence.

In 2021, my desire for Data Science and Machine Learning was overflowing and I desperately wanted to focus my heart and mind in the work. I was given the wonderful opportunity to the join the newly developed Innovation team at Boise Cascade where I would oversee field-level research and development for the southern region with plants in Louisiana, Alabama, and South Carolina. I

immediately started post-graduate studies in Data Science and Machine Learning at MIT through company sponsorship. My work today is split between finding solutions to improve cost positions in labor with advanced technology like robotics and AGV's and solving business problems with data science and machine learning.

I pride myself as a "full stack" solutions provider with the ability to collect, wrangle, clean, model, and deploy data driven solutions in manufacturing with skills in: PLC (Allen-Bradley), SQL, JavaScript (Angular, React, jQuery, Node.JS), CSS (Bootstrap), HTML, Python (Django, Flask, Streamlit, Pandas, Numpy, Matlab, Seaborn, TensorFlow, PyTorch, OpenCV, NetworkX, SciPy, and Scikit-Learn), Power BI, and Ignition.

My current work and research is centered around robotic solutions for labor reduction, anomaly detection in temporal data, dimensionality reduction for big plant data, and reinforced learning models for manufacturing systems.