Adam DeJans Jr.

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Applied Operations Research Scientist | Published Author

Applied operations research scientist with a decade of experience designing and deploying large-scale optimization and simulation systems in production environments. Expertise in mixed-integer programming, stochastic modeling, decomposition methods, and algorithm design for supply chain and logistics applications.

Led end-to-end development of decision systems impacting $60B+ in annual planning decisions, including production planning, vehicle routing, scheduling, and demand-supply matching. Strong background in translating ambiguous business problems into mathematically rigorous models, validating through simulation and experimentation, and scaling to enterprise-grade cloud deployments.

Experience

Technical Staff Member (Customer-Facing Optimization Engineering) August 2025 – Present
Gurobi Optimization *Beaverton, OR*

- **Advanced MILP Diagnostics:** Led deep technical investigations of branch-and-bound search behavior, cut generation, LP relaxations, and numerical conditioning. Identified formulation pathologies and redesigned models to reduce integrality gaps, eliminate symmetry, and improve convergence robustness.
- **Algorithmic Scaling:** Re-architected large-scale optimization models using decomposition, reformulation, and symmetry-breaking techniques. Enabled **2–5× instance growth** while maintaining numerical stability and predictable solve performance.
- **Performance Engineering:** Executed structured solver tuning workflows including concurrent MIP strategies, presolve control, cut management, memory optimization, and thread configuration. Delivered **30–70% runtime reductions** and improved performance reproducibility across production workloads.
- **Optimization System Architecture:** Advised engineering teams on designing scalable optimization pipelines, including model-build separation, asynchronous solve orchestration, cloud deployment patterns, failure handling, and performance monitoring. Helped teams transition from prototype notebooks to production-grade decision systems.

Principal Decision Scientist II August 2022 – August 2025
Toyota North America (Supply Chain & Fulfillment) *Plano, TX*

- **Supply Allocation Optimization:** Designed and implemented Toyota's North American supply allocation engine using *Mixed-Integer Linear Programming (MILP)* in *Gurobi*, optimizing profit, greenhouse gas reduction, and volume (market share). The model generates a two-year strategic production plan, integrating supply and factory constraints with demand forecasts. Built a UI-based *scenario-planning tool* enabling vendor and supply what-if analysis, directly impacting **$60B in decisions** and increasing production by **40,000 vehicles**, yielding **$390M in additional profit**.
- **GenAI-Powered Scheduling Explainability:** Integrated large language models into Toyota's production line scheduling and resequencing optimizer, enabling planners to query solver logs and run natural-language "what-if" scenarios (e.g., adjusting shift patterns or resequencing builds). **Reduced diagnostic time by 40%**, accelerated scenario analysis from hours to minutes, and increased adoption of advanced scheduling tools across 15+ production planners.
- **Automated Vehicle Ordering System:** Developed an ordering recommendation engine leveraging *tree-based regression models* for regional demand forecasting. Linearized the forecast into an *MILP* model in *Gurobi* to optimize option and color mixes while satisfying supply and manufacturing constraints. The system provides optimal ordering recommendations to regional managers, increasing profit by **$64M**.
- **Accessories Recommendation:** Built a *customer segmentation model* using demographic, financial, and geographic data (age, income, weather, leasing behavior). Designed an explainable heuristic model that analyzes top-performing dealers within each segment and recommends ordering strategies for underperforming dealers. Optimized **$700M in inventory**, increasing **profits by $42M**.

Senior Artificial Intelligence Consultant September 2021 – August 2022
Infosys Consulting (AI & Automation) *Lisle, IL*

- **Package Delivery ETA:** Designed and deployed a **real-time AI-driven logistics system** using *deep learning (TensorFlow)* on *Azure*, processing **300M+ data points daily** to predict estimated time of arrival (ETA) for package deliveries. Architected an end-to-end cloud-based AI pipeline integrating *Kafka, Spark (Databricks), Docker, Kubernetes, and Azure Event Hubs.* The deep learning model employed a *wide & deep architecture* for demand forecasting, trained and inferred on billions of records, significantly improving ETA accuracy.
- **Expedited Shipping:** Developed a custom heuristic that leveraged the ETA predictions and incorporated real-time logistics data, cost considerations, and SLA constraints to minimize late deliveries.

Data/Operations Research Scientist August 2018 – September 2021
Ford Motor Company (Autonomous Vehicles & Smart Mobility) *Dearborn, MI*

- **Point-to-Point Mobility Optimization:** Invented and patented a *dynamic programming*-based route optimization algorithm in *Java*, **US20210133643A1**. Developed as part of a public transit navigation system, deployed as an *Android* application for multimodal route planning.
- **Vehicle Fleet Simulation:** Led the development of a *discrete event simulation tool* for fleet sizing and operational analysis. The simulation platform evaluated on-demand and fixed-route strategies, directly leading to a **27% fleet size reduction** while ensuring service reliability. Built using *Python (SimPy)* for event-driven modeling and *React* for UI-based scenario analysis.
- **Vehicle Routing Algorithms:** Developed several *VRP algorithms* for use cases such as ride-hail, shuttle, grocery delivery, and non-emergency medical transport services. Implemented *simulated annealing* and *genetic algorithms* to solve dynamic routing problems. Deployed in *Java (Spring Boot)* as RESTful APIs, successfully scheduling **over 300,000 trips**.

Software Engineer February 2017 – August 2018
Marposs Corporation *Auburn Hills, MI*

- **Automated Report Generation:** Developed a text-mining automation tool using *Python (NLTK, Pandas, Flask)*, reducing manual report generation time by **30%** for engineers and managers.

Technical Skills

Optimization & Simulation: Gurobi, CPLEX, Pyomo, SimPy, Discrete Event Simulation, MILP, MINLP, Stochastic Optimization, Decomposition (Benders, Dantzig-Wolfe), Heuristics/Metaheuristics

Programming Languages: Python, Java, SQL, C++

Data Science & Machine Learning: Pandas, scikit-learn, TensorFlow, XGBoost, LightGBM, Clustering, Classification, Regression, Time Series Forecasting, NLP (spaCy, NLTK), Reinforcement Learning

Data Engineering & MLOps: Databricks, Azure ML, AWS SageMaker, Spark, Kafka, Airflow, Docker, Kubernetes, Git, CI/CD

Frameworks & Tools: Flask, FastAPI, Dash, Spring Boot, Hibernate, Plotly, Matplotlib, PowerBI/Tableau

Publications & Patents

Books
Bit Bros LLC

- **The Decision Factory** (2026)
  A novel about decisions under uncertainty, with a foreword by
  Warren B. Powell, Professor Emeritus, Princeton University.
  Consistent best seller in Stochastic Optimization.
- **The MILP Optimization Handbook** (2025)
  Introductory resource on linear and integer programming for applied practitioners.
  Consistent best seller in MILP Optimization.
- **The Linearization Handbook for MILP Optimization** (2025)
  Practitioner's guide to modeling tricks and patterns for linear and integer programming.
  Consistent best seller in MILP Optimization.
- **You Got the Data Job... Now What?** (2024)
  Practical strategies and frameworks for advancing in data and decision science careers.

White Papers
Gurobi Optimization

- Intelligence, Optimization, and the New Decision Frontier (2026)

Patents
Ford Motor Company

- Dynamic programming-based route optimization algorithm (US20210133643A1).

Education

Oakland University *Rochester, MI*
M.Sc. Industrial Applied Mathematics August 2018
B.Sc. Mathematics April 2016

Certifications: AWS ML, Azure AI, Oracle Java SE8