Davut Ayan, PhD

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SUMMARY:

Expert Data Scientist with over 5 years of experience in developing and deploying machine learning models, hands on experience with Generative AI, and causal inference techniques to drive data-driven decision-making in marketing and business intelligence. Proficient in Python, R and SQL with expertise in predictive modeling, customer segmentation, and A/B testing to enhance campaign effectiveness and optimize ad spend. Skilled in leveraging cloud platforms like Snowflake, Azure, and Databricks to build scalable data pipelines and deploy advanced analytical solutions. Proven track record in managing cross-functional projects and mentoring junior data scientists, fostering a collaborative and high-performance environment. Strong foundation in economics and marketing analytics, adept at translating complex data into actionable insights for strategic growth.

TECHNICAL SKILLS:

Programming Tools: Python, R, STATA, SQL, RSpark, PySpark, Tableau, Power BI, R Shiny, Streamlit, Pandas, NumPy, Scikit-learn, Keras, PyTorch, TensorFlow, Hadoop, CatBoost, PyTorch, MLlib, H2O, Databricks, AWS, Azure

Statistical Modeling: Causal Inference Models, Difference-in-Differences, Instrumental Variables, Synthetic Control, Regression Discontinuity, Propensity Score Matching, Experimentation, A/B Testing, Survival Analysis

Machine Learning and AI: Machine Learning, Deep Learning, Supervised Learning, Logistic Regression, Random Forests, Gradient Boosting, XGBoost, Time Series Forecasting (ARIMA, SARIMA), Unsupervised Learning, Factor Analysis, Principal Component Analysis, Cluster Analysis, Natural Language Processing (NLP), LLM, Generative AI, Computer vision, Association Rules

EXPERIENCE:

Data Scientist, Associate Director, Horizon Media, New York **Mar 2022 - Present**

- **Developed and optimized machine learning pipelines** for marketing analytics using cloud platforms such as Snowflake, Azure, and Databricks, enhancing the efficiency and accuracy of data processing.
- **Deployed predictive models** for lifetime value, churn, and look-alike audiences using supervised learning and ensemble techniques like **XGBoost, Random Forest**, and **Gradient Boosting**, achieving a 15% optimization in marketing spend while significantly enhancing campaign relevance, reach, and effectiveness.
- **Engineered high-performance scripts** to generate balancing weights for large datasets, ensuring marketing insights are accurate and representative of the U.S. population, reducing processing time and cost by 95%, and minimizing dependency on external data purchases.
- **Leveraged Generative AI and Large Language Models (LLMs)** to interpret descriptive demographic analysis and generate actionable marketing insights, including audience weighting to project market size. Successfully deployed these insights as a cloud-based web app using Streamlit on Snowflake.
- **Conducted data-driven market analysis and customer segmentation** using RFM, k-means, hierarchical, and CLARA clustering, uncovering insights into customer behavior to enhance targeted marketing campaigns.
- **Applied advanced causal modeling techniques** such as Difference-in-Differences and Propensity Score Matching to evaluate campaign effectiveness, ensuring accurate and actionable impact assessments.
- **Performed comprehensive analytics** including time series analysis, demographic analysis, market basket analysis, and customer journey analysis to drive strategic marketing decisions and enhance business growth.
- **Measured and optimized campaign performance** through Year-over-Year (YoY) analysis, media exposure analysis, and media mix modeling (MMM), resulting in continuous improvement of marketing strategies and a 10% increase in customer conversion rates.
- **Estimated customer lifetime value** followed by A/B testing of personalized versus fixed user bids, resulting in a 15% increase in conversions and a 10% reduction in ad spend.

Postdoctoral Researcher, University of Kansas, Kansas **Feb 2021 - Mar 2022**

- **Conducted advanced research** on regression discontinuity design to assess the causal impact of state government party affiliation on social safety programs using state-level datasets.
- **Analyzed the effects of Medicaid expansion** on healthcare utilization and state expenditures by applying synthetic control methods, resulting in multiple publications that influenced state-level healthcare policy decisions.
- **Demonstrated expertise** in data collection, data mining, feature engineering, and data visualization, utilizing data-driven research methodologies to generate impactful insights.
- **Managed diverse data sources** and performed data extraction, transformation, and analysis using R, enhancing data quality and reliability.
- **Conducted regression analysis in STATA** and developed a comprehensive data dictionary to standardize data usage across projects.
- **Collaborated on innovative modeling methodologies** to estimate global researcher numbers, leading to a publication in a peer-reviewed journal.
- **Presented research findings on the causal impacts of federal legislation** on U.S. veteran employment at the 91st Southern Economic Association Annual Meeting, highlighting advanced causal inference methodologies and contributing to scholarly discussions in economics.

Lead Economist, Lecturer, National Defense University, Turkey **Aug 2016 – Feb 2021**

- Taught **Introduction to Economics** and contributed to curriculum development and course planning.
- Led **training exercises** and collaborated on **operational planning** for emergency and disaster management units, enhancing readiness and response capabilities.
- Conducted **risk analysis** and supported broader **risk assessment initiatives** within the Ministry of Defense, focusing on disaster and emergency management.
- Developed and refined **operational scenarios**, **disaster risk assessments**, and **action plans** for national-level projects to ensure effective preparedness.
- Directed multi-agency **disaster response units** during **international disaster and risk management exercises**, ensuring smooth coordination across teams and stakeholders.

EDUCATION:

- Doctor of Philosophy (PhD), Economics, University of Kansas, KS
- Master of Arts (MA), Economics, University of Kansas, KS
- Bachelor's Degree (BS), Industrial and Systems Engineering, National Defense University

PUBLICATIONS:

- Ayan, D, Haak, L, Ginther, DK. How many people in the world do research and development? Global Policy, 2023. https://onlinelibrary.wiley.com/doi/full/10.1111/1758-5899.13182
- Ginther, DK, Ayan, D, Slusky, DJG. Economic Costs to Kansas Due to State's Failure to Expand Medicaid. The Reach Foundation, 2022. https://kuscholarworks.ku.edu/handle/1808/32851
- Ginther, DK, Ayan, D, Slusky, DJG. The Unexpected Costs of Not Expanding Medicaid in Kansas. Institute for Policy & Social Research at University of Kansas and Reach Foundation, 2022. https: //ipsr.unit.ku.edu/CSTEP/PDF/Medicaid_Brief_2022.pdf