ARMANDO BERNAL

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OBJECTIVE

Seeking a technically challenging position applying optimization, statistics, and state-of-the-art machine learning methods to develop actionable and interpretable solutions to drive business-decision.

EDUCATION

- University of Michigan (U-M) — Jun 2014 – Apr 2020
  PhD Industrial and Operations Engineering — GPA: 3.82|4.0
- Stanford University — Aug 2011 - Mar 2013
  M.S. Electrical Engineering — GPA: 3.52|4.0
- University of Illinois at Urbana-Champaign — Aug 2006 - May 2010
  B.S. Mechanical Engineering — GPA: 3.56|4.0

PROFESSIONAL EXPERIENCE

PepsiCo (Optimization Engineer 12+ month contract, REMOTE) Apr 2021 - Current

- Determined implementable price points for all Pepsi products for domestic and international markets that maximized Pepsi and retailer revenue using machine learning, linear, and nonlinear optimization.
- Developed column generation method to solve pricing and promotion selection optimization problems, effectively merging 2 models that were separate.
- Partnered with DevOps to build CI/CD pipeline using GitHub Actions
- Translated business technical requirements into linear and nonlinear optimization constraints to be solved using CPLEX solver and DOCPLEX modeling language.
- Built an optimization software engine to be used for any Pepsi market by business clients to produce end-to-end solutions in days instead of weeks using SQL-based Google BigQuery to query for input financial data.
- Applied constraint programming to determine scheduling of promotions and used solutions as a warm start to pricing optimization problems.

Amobee (Operations Research Scientist, Baltimore, MD) Apr 2020 - Apr 2021

- Matched TV networks and advertisers to maximize digital and TV ad slots usage effectively while simultaneously meeting advertiser's budget and KPI constraints.
- Implemented and modeled various nonlinear business client requirements to be solved by linear programming solvers.
- Introduced proof-of-concept optimization strategy to arrive at faster business solutions.
- Cleansed GAMS LP model code for increased readability and better model generation time.

Revenue Management (Thesis - University of Michigan) Jan 2017 - Apr 2020

- Worked on online dynamic pricing policies using upper confidence bounds and statistical concentration inequalities to maximize revenue under general uncertain environments.
- Developed static pricing policy and mathematically proved optimal performance for a company selling re-usable products operating under general stochastic environments requiring minimal prior information.
- Utilized CPLEX to solve for optimal pricing policies and tested the performance and robustness using Python simulation packages.

Edward Jones (Advanced Analytics Intern, St. Louis, MO) May 2018 - Sep 2018

- Optimized the nonlinear Sharpe Ratio function to produce portfolios that balance return and risk.
- Implemented ad-hoc branch-&-bound algorithm to account for business disjunctive constraints in Python.

RAND Corporation (Operations Research Intern, Santa Monica, CA) May 2015 - Aug 2015

- Implemented dynamic programming methodologies to aid the Air Force in the cost-benefit analysis for upgrading their air traffic control to GPS.
- Aided in the collection, cleaning, and storing of weather data relevant for analysis using SQL and Python.

Sears Holdings Corporation (Data Analyst, Hoffman Estates, IL) Feb 2014 - Jun 2014

- Developed automated dashboards for monitoring and streamlining reporting key performance metrics.
- Modeled and analyzed consumer data to understand purchasing behavior to design effective personalized emails.

LEADERSHIP EXPERIENCE

Society of Hispanic Professional Engineers (SHPE) Aug 2007 - Current

- Arranged full-day academic outreach events for Detroit and Grand Rapids high-school students to provide insights into diverse career paths, college applications, scholarships, and summer programs.
- Implemented mentoring program to establish networking relationships between students and SHPE alumni.
- Arranged professional networking events to provide SHPE students industry and research career opportunities.
- Mentored and advised SHPE underclassmen through their freshman and sophomore years to streamline their high school-college transition and academic success.
- Arranged high-school visitation events to increase STEM interests among rising junior and senior students and increase college enrollment from graduating seniors.

SKILLS

Computer Languages and Systems: Matlab, R, Python, C++, Java (Coursework), UNIX/Linux, SQL, GitHub, BitBucket, Azure Databricks, AWS, Domino, GitHub Actions, MWAA Airflow, AWS Lambda, Sagemaker, Docker
Optimization Solvers and Modeling Systems: Pyomo, GAMS, CVX, AMPL, CPLEX, CBC, Gurobi, Tensorflow, Scikit-Learn, Keras, Gurobipy, Docplex, PuLP, Google OR-Tools
Languages: English (Native), Spanish

AWARDS

Rackham Merit Fellowship

PUBLICATIONS

- A. Bernal, C. Shi. “Network Revenue Management with Reusable Resources and Advance Reservations”, Production and Operations Management, *to appear*.
- A. Bernal, C. Shi. “Online Pricing for Revenue Management with Reusable Resources”, Management Science, *to appear*.

PHD THESIS

- A. Bernal, “Pricing in Network Revenue Management Systems with Reusable Resources”

TEACHING

- Introduction to Linear Programming – IOE 310 (Fall 2017, Winter 2018, Fall 2018)
- Queueing Systems – IOE 416 (Winter 2019)
- Linear Programming – IOE 510 (Fall 2019)