Matt Dzugan

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Data-Driven Designer, Modeler & Architect of Space-Communications Systems

Work Experience

The Boeing Company, Satellite Development Center — 2012 to Present
El Segundo, California — **2017 World-Class Engineer Award Recipient**

Senior Communications Systems Modeling-and-Simulation Architect

Identified key system-level design decisions & modeled their outcomes & impacts for 3 unique satellite systems

- Traded several vastly different architecture solutions by building detailed computational models of the systems, evaluating performance using many standard and custom metrics, and estimating impacts to both capital and operating expenditures
- Invented industry-leading (patents pending) solutions to:
  - weather dependent power pooling in direct-radiating-array antennas
  - streaming operations for space-based video-on-demand services
  - optimal geographic siting of nodes in constrained and dynamic-connectivity networks,
  - minimum angular area definition while maintaining full volumetric coverage
- Created now-standard software tools and models for network throughput optimization/calculation, 3-dimensional multipath & reflection analysis, system performance and geospatial data visualization
- Regularly communicated analysis results to internal and external audiences, executive and technical, most notably to the Wireless Telecommunications Bureau of the FCC (Federal Communications Commission) which involved communicating the results of over 4 TB of data to a largely non-engineering audience

Senior New Business Campaign Team-Lead: End-to-End Communications-System Architecture

Led the End-to-End team on multiple design bids resulting in winning over $1B in new satellite contracts

- Communicated data with external customers, and professionally challenged their assumptions allowing the internal Boeing team to pursue design options that were ultimately critical to our contract awards
- Iterated through multiple design iterations, tasking the internal team with actionable exploratory analyses, and creating several key performance metrics to engage the potential customer and mature the design

Digital Signal Processing Algorithms Designer

Designed and tested error-detection/correction algorithms and circuits used on 4 spacecraft currently on orbit

- Designed several error-detection/correction algorithms using MATLAB & Simulink and identified pros and cons of each to enable final selection for flight hardware
- Implemented my design in VHDL and developed a suite of 100+ test waveforms, and executed them via Hardware-in-the-Loop tests to ensure the intended functionality

The MITRE Corporation, Software Defined Radio Group — Summer 2011
San Diego, California

Motorola, Global Network Systems — Summer 2010
Schaumburg, Illinois

Education

Master of Science — 2012
Department of Electrical Engineering & Computer Science — 3.8 GPA
Northwestern University — Evanston, IL

Bachelor of Science — 2012
Department of Electrical Engineering & Computer Science — 3.8 GPA, Magna Cum Laude
Northwestern University — Evanston, IL

Technical Skills

Analysis/Modeling/Simulation · Parallel Computing · Communication/Visualization/Explanation

Bash · C · C++ · Javascript (Cesium, D3, Three) · MATLAB/Simulink · Python (scikit-learn, NumPy, Pandas) · SQL · Tableau · VBA · VHDL/Verilog