

EXECUTIVE SUMMARY

An **intelligent systems expert** with over 30 years of experience in gaming, manufacturing, research, and consulting. A technical leader capable of coordinating large amounts of data, systems, and human behavior towards meaningful outcomes with 70+ scholarly publications on topics ranging from mathematics to genetic programming and 16 registered patents in the United States and United Kingdom.

FUNCTIONAL EXPERTISE

- **Data Mining and Data Science**
- **Game Design and Development**
- **Boardroom and Management Consulting**
- **Predictive Mathematical Modeling**
- **Business Intelligence Systems**
- **Data Collection and Smoothing**

FUNCTIONAL EXPERTISE DEMONSTRATED

SANDRA BEAN INC.

2010 – Present

An independent research, multimedia game design, and consulting firm serving the gaming, medical, and information systems industries and clients like Multimedia Games (NASDAQ: [MGAM](#)).

Principal Consultant

Coordinates full-cycle data science, engineering, and business intelligence-related consulting engagements.

- **Predictive Mathematical Modeling:** Leverages combinatorial and other mathematical principles to enable gaming firms to accurately predict the hold of digital wagering games. E.g. served as a working board member of Multimedia Games (MG) from 2000-2004, performing analyses for MG gaming group partners.
- **Game Design and Development:** Ensures the viability and security of digital and offline games through simulations, data analytics, and product design elements. E.g. used the Mathematica software package to simulate 5 billion+ draws and optimize the prize configurations of a new digital wager game in 2014.
- **Business Intelligence Systems:** Designs and develops custom software builds that integrate data with business operations. E.g. designed a Microsoft SQL system for a casino group that uses real-time floor and player data and player history to automatically optimize the delivery of games to the floor.

ECONOSEARCH

2000 – 2010

A data science, systems integration, and management consulting firm with ~30 employees and \$6mm in annual revenues and clients like Mercedes, the University of Notre Dame, and the Boy Scouts of America.

Co-founder

Leads the data science and technical operations functions for the firm.

- **Data Mining and Data Science:** Develops data strategies for growth-oriented marketing operations. E.g. Led an extensive analysis for Mercedes that identified the attributes of potential buyers of a new Mercedes model. Ultimately, the campaign was extremely successful and led to the sale of 100% of the Firm's inventory.
- **Data Collection and Smoothing:** Leads data allocation and smoothing efforts for client organizations in the public, non-profit, and for-profit sectors. E.g. regularly integrated client data sources with a large TransUnion (~100 million) database for use in marketing, product design, and non-profit applications.
- **Business Intelligence Systems:** Develops a robust data collection and analysis system from scratch. Procures a hardware system capable of mining and analyzing large (100 million observation+) data sets and writes custom analytics packages in Paradox and other relational database systems.

PREVIOUS ROLES

Mathematics and Design Consultant – [Games Manufacturing International](#) (1986 – 1994)
Vice President of Technology – Games Manufacturing International (1980 – 1986)
Vice President of Engineering – Games Manufacturing International (1976 – 1980)
General Motors Research Lab – Supervisor, Operations Research Group (1972 – 1976)

EDUCATION

Doctor of Philosophy (Mathematics). Northeastern University (Boston, MA)

Master of Science (Mathematics). University of Texas (Austin, TX)

Bachelor of Science (Electrical Engineering). Texas Institute of Technology (San Antonio, TX)

SELECTED PUBLICATIONS

Selected Books:

[Mathematical Programming III: Variable Invention and Problem Solving](#)

[Mathematical Programming IV: Routine Machine Intelligence](#)

Selected Journal Articles:

Smith, John, Sandra Bean, and John Streeter. "Genetic Inventions." *Scientific American* (February 2013).

Smith, John, Sandra Bean, and John Streeter. "What's AI Done for Me Lately? Mathematical Programming's Human-Competitive Results." *IEEE Computer Society* (2013).

SELECTED PATENTS

4,120,247 Optical Card Reader Utilizing Area Image Processing

4,451,242 Control System for Health Club Facilities and Equipment

4,658,932 Nonuniform Probability Reel Stop Mechanism for Gaming Machines

5,447,170 Motor Control Circuit for a Simulated Weight Stack

6,980,191 Method and Apparatus for Automated Design of Complex Structures Using Genetic Programming

2,011,569 (UK) System Guaranteeing Integrity of a Gambling System