

Vincent W. Freeh, PhD

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SUMMARY

I have a passion for data analytics. GridIronMine.com was a website I developed with a colleague to perform football analytics. Among the tools we created was one of the first victory forecast algorithms. I collaborated with the strength and conditioning coaches at NC State on a project that collects training and biometrics data on athletes and employs predictive analytics in order to improve performance and reduce injury. I am currently working on a project with a professor in the Department of Agriculture to provide predictive analytics to increase profit and manage risk in farms.

EXPERIENCE - Academia

Associate Professor, Department of Computer Science, North Carolina State University

Raleigh, North Carolina — 2003-present

Assistant Professor, Department of Computer Science and Engineering, University of Notre Dame

Notre Dame, Indiana — 1996-2003

My core areas are distributed systems, storage systems, and operating systems emphasizing state-of-the-art technologies. I have conducted research in cloud computing, big-data, distributed systems, file and storage systems, power/energy management, security, and high-performance computing. My current focus combines machine learning and data-intensive computing systems.

Accomplishments

- Taught 50+ courses (16 unique) to more than 2000 students.
- Awarded more than 2 dozen grants totaling approximately \$9M.
- Published 60+ peer-reviewed papers.
- Editor, committee member, or reviewer for more than 50 journals or technical conferences.
- Directed 19 MS and PhD theses; faculty mentor for Linux Users Groups for nearly 20 years.

Highlights

- Developed *Enterprise Storage Systems* course with assistance of local storage vendors EMC, NetApp, and IBM.
- Developed *Data-Intensive Computing* course in collaboration with local big-data company Lexis-Nexis.
- Significant industry support (IBM, NetApp, Lexis-Nexis, Amazon Web Services).
- Spent sabbatical year (2012-2013) with NetApp conducting performance analysis.

Farm analytics

Established a joint research program with an economics professor in the Agriculture and Resource Economics Department to collect and analyze agricultural data. We collected diverse datasets from US and state departments of agriculture, Chicago Mercantile Exchange (commodity futures), NOAA (weather data), and others. The raw data is deposited into a data lake. Structured data from the lake is maintained in a data warehouse. Several decision-support applications have been and are being developed. The crop selector tool determines which crops to plant in order to balance risk and return. For a medium sized farm the number of possible scenarios is intractable so the solution uses a heuristic. To reduce risk farmers will hedge with crop futures. So, we developed another tool that uses historical trends of futures price, cash price, and yield to build probability distributions of gross revenue for several hedging strategies.

Athlete 360

Established a joint research program with strength coaches at NCSU to monitor and analyze real-time physiological data. Collected data from various devices including heart-rate monitors, GPS sensors, jump plates, and barbell motion detectors. Developed the database to organize the data. Created statistical and machine learning models. Deployed a website for displaying data and analysis. Our analyses provided input to strength coaches to evaluate an athlete's status and the efficacy of various exercise regimens. We developed a preliminary machine learning model to predict an injury *before* it occurs.

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EXPERIENCE - Software Development & Entrepreneurship

SECeek.com, personal project

Holly Springs, North Carolina — 2017-present

Website (currently offline) presents SEC form data and analysis.

Accomplishments

- Created *BoardWatch* tool that presents a network of connections to companies and individuals for board members.
- Created *Insider* tool that tracks ownership changes of company principals.
- Developed a natural language processing model to “read” SEC Form 8-K.

VP of Engineering (co-founder), Data Decision Models

Raleigh, North Carolina — 2013-2016

Company marketed a big-data product for lead development that reads hundreds of thousands of web pages extracting *signals of opportunity* using natural language processing specifically developed for each client’s data mining needs.

Accomplishments

- Architected big-data infrastructure in Amazon Web Services.
- Designed, supervised, and built frontend, backend, and analytics.
- Company liaison to our clients for product development, implementation, training, and improvement.
- Supervised 5 developers and engineers.

President (co-founder), HealthyBackup.com

Raleigh, North Carolina — 2011-2013

Company built one of the first HIPAA-compliant backup systems for medical records. It collected, compressed, and uploaded data to the cloud.

Accomplishments

- Architected our software-as-a-service (SaaS) solution.
- Architected and implemented frontend and backend in Amazon Web Services.
- Designed and implemented the HIPAA compliant backup service.

President (co-founder), GridIronMine.com

Holly Springs, North Carolina — 2007-2009

Created a football analytics web site around our *victory forecast* analysis—which, given any game situation, returns the probability of victory at that point. Wrote articles for *Patriots Football Weekly* for the 2007 season.

Accomplishments

- Built the web frontend running on Amazon Web Services.
- Co-created *victory forecast* model using logistic regression and state machine modeling.

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EXPERIENCE - Consulting (FreehEnterprise.com)

Diverse experience developing custom web sites and proof of concept systems.

US Performance Center

Created a proof of concept system to display performance data from exercise machines. System gathers, organizes, and displays performance data and analytics.

Soundmetrix

Startup company developing a medical diagnostic device using multiple microphones. Created a machine learning model to identify COPD (a respiratory ailment) from sound files.

BNAfit

Developed backend and website for a startup company. Users watch workout videos on their phone or browser. The backend tracks user progress and provides an interface for trainers to create and manage workouts.

Briskwater

Ported a Lithium-Ion battery simulator from MATLAB to Python. Parallelized the simulator. Built a system incorporating the simulator for prototyping experimental battery controllers in order to maintain capacity and extend lifetimes of batteries.

EXPERIENCE - Other notable

IBM, Storage System Division, Tucson, Arizona - Development Team Leader —1990-1991

Led six developers who created the first “all-points” addressable print engine for the Advanced Function Printer family of printers ahead of schedule.

US Army, 23d Engineer Battalion, 3d Armored Division, Hanau, West Germany — 1983-1986

Served as platoon leader, company executive officer, and assistant battalion operations officer. Promoted to rank of Captain. Graduated from Airborne School and Ranger School.

EDUCATION

1996 PhD in Computer Science (minor in Mathematics) University of Arizona.

Dissertation: Software Support for Distributed and Parallel Computing

1989 MS in Computer Science, University of Arizona, Tucson, Arizona.

1983 BS in Engineering Mathematics, University of Arizona, Tucson, Arizona.

SKILLS

- Excellent written and oral communication skills.
- Long history of managing in diverse environments: soldiers, software engineers, students, and contractors.
- Extensive record of collaboration with colleagues in academia and industry.
- Highly accomplished public speaker.

REFERENCES

Available upon request.