Jeffrey Freeman

Curriculum Vitae

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"Happiness does not come from doing easy work but from the afterglow of satisfaction that comes after the achievement of a difficult task that demanded our best." - Theodore Isaac Rubin

25 Years of Overall Experience

22 Years of Public Speaking

20 Years of Management Experience

40 Maximum Team Size Managed

7 Positive References

Computer skills

Advanced Apache Jena, Artificial Neural Networks, Bayesian Networks, Big Data, Databases, CXF Framework, Elasticsearch, Evolutionary Computing, Genetic Algorithms, Graph Databases, Graphical Models, Genetic Programming, Hadoop, Hibernate, Hidden Markov Model, Inference Engines, J2EE, Java, JavaScript, JAXP, JDBC, JSP, Linux, Machine Learning, Map Reduce, Markov Chains, MongoDB, Multithreading, MS SQL, MySQL, Naive Classifiers, Natural Language Processing, NoSQL, Oracle Database, PostgreSQL, Regression Analysis, RDF, RESTful, SAX, Self Organizing Maps, Semantic Computing, SOAP, Spiking Neural Networks, Spring, Spring Boot, Spring MVC, SQL, Tinkerpop, Titan Database, UML, XML

Intermediate AWT, Bash script, C, C++, CSS, HTML5, Java Native Interface, JavaServer Faces, Microsoft Windows, OAuth, Python, Ruby, Scala, Tomcat, Digital Signal Processing, SAML, Swing

Basic Assembly, Docker, LaTeX

Experience

Career

2021
2023

Chief Information Officer & EVP, Scentech Medical, Ltd., Rehovot, Israel.
Originally hired as a consultant to lead a team with the intention of inventing from scratch a **breath analysis** system capable of **identifying diseases in humans** with high accuracy in minutes. Within 3 months we had developed a working prototype to **identify COVID off a breath sample with 91% accuracy**. I was then hired full-time as Chief Information Officer and Executive Vice President to take the project to production. I was the **direct boss of all department heads**: chemistry, clinical, and information technology. The only area I didnt handle directly were legal concerns. I was also responsible for much of the conversation with clients and investors.

The position required **managing** over 20 employees and taking a **mentor** position, particularly with the IT team which lacked a senior developer due to funds. Many times I would have to contribute source code and **architectural design** documents and define the core **algorithms** and frameworks. Was also responsible for **hiring**, **firing**, **budget**, and **company vision** along side the CEO of the company.

2002
2022

Chief Technology Officer & Programmer, Syncleus, Inc., Philadelphia, PA.
I founded the company in 2002 and acted as the Chief Technology Officer, **software architect**, and **project lead** overseeing over a 100 projects and ensuring deadlines and requirements were met. The company specializes in **Big Data** and **Data Analytics**. Total team size as high as 40 staff of which 15 - 35 of them were developers at any given time, average staff size closer to 20 however. The team was largely **remote**, including **open-source contributors**, making for a unique work environment. Also took on a development role on many of the projects, particularly when a project was behind, or reached a difficult technological road block, and developed many of the core algorithms. A large portion of time was spent **mentoring** junior members and designing the **architecture** for new systems, as well as coding implementations. Worked heavily with standard and non-standard stacks including **Tomcat**, **Java**, **J2EE**, **Hibernate JPA**, **NoSQL Databases**, **MongoDB**, **TinkerPop**, **Hadoop**, **Apache Jena** and related technologies. Syncleus is a heavily **open-source** oriented company both consuming and producing **open-source** libraries as part of it's mission statement.

Development and design specifically focused on **artificial intelligence**, **big-data**, **graphical models**. **statistical analysis**, **regressional analysis**, **distributed processing**, **multithreaded parallel processing**, **natural language processing**, **semantic computing** & **evolutionary computing**. **Unit testing**, **good coding practices**, and thorough **documentation** were high priorities on every project. Developed both traditional and novel technologies such as **Backprop Neural Networks**, **Self-organizing Maps**, **Bayesian Networks**, **State Vector Machines**, **Markov Chains**, **RDF**, **MapReduce**, **Hidden Markov Models**, and many others. There was also a great deal of focus on advanced mathematics such as **graph theory**, **linear algebra**, **statistics**, **vectors**, and **complex numbers**.

Experience included **full project life cycles** from design to production. Worked heavily with **PostgreSQL**; specifically **PL/SQL procedures and triggers**. Configuration files on several projects were read using the **Java SAX XML** library. Worked closely on **communication protocols** done via web-services such as **SOAP** and **RESTful** as well as low-level protocols such as **TCP** and **UDP**. Finally, **server and client** implementations utilizing various **Linux** flavors on the server side were common requirements. Also worked with **Mac OSX**, **Windows**, and **Linux** on the client side.

Some of the specific technologies I developed include the following (See below for oroject details): **dANN**, **AIDE**, **Population injected verhulst model (PIVM)**, **Aparapi**, **Hyperassociative map (HAM)**, **Genetic wavelets (GW)**, **Neurally compressed image (NCI)**, **Graph affinity network**.

1997
2002

Chief Technology Officer & Programmer, Swapoo, Inc., Philadelphia, PA.
I founded this company in 1997 and acted as **Project lead** for a team of 2 other programmers. Published a **client-server** application, named Swapoo, a **file-sharing** program similar to Napster written in C++. Within the first week of publication we had over 32,000 hits per day as well as links on over 10,000 web sites with no cost to advertising. Responsibilities included acting as a **spokes person** for interviews in **over 30 national news reports** including **CNBC** twice, **front page of USA Today**, **Slashdot.org**, **CNET news twice**, **ZDNet**, **Fortune magazine**, **Business Week**, and **CNET Radio 910Am** San Francisco.

Worked to develop the precursor to the Swapoo **client-server** in **Java** as well as **multi-platform C++**, called RomNET. **MS SQL database** interfaced via **SQL** and **ODBC** to store user information. It implemented file-specific **compression algorithms** to greatly improve file transfer times. Established design procedures using **UML** and **unit tests** to improve stability. The system utilized **TCP** client-to-client and client-to-server protocols. The network and **search algorithms** were governed by **machine learning algorithms**.

Consulting & Contracting

2015
2017

Technical Lead & Programmer, Treeline Interactive, San Diego, CA.
Consultant and team lead focusing on **Java J2EE**, **Hibernate JPA**, and **CXF Frameworks**. Also acted as a **Big Data** Consultant across several projects, and authored several novel algorithms of the Graphical Model type for Treeline. Worked heavily with the **Elasticsearch** as part of the back-end, as well as **Spring** frameworks.

2014
2015

Lead Programmer, Comcast, Philadelphia, PA.
Worked as a lead programmer on Comcast's new back-end providing TV and Movie metadata for their various services. I also worked on various components performing **Big Data** analysis. The database access was at first based on **Hibernate JPA** but I was in charge of moving most of that over to **NoSQL**, specifically **MongoDB**. The backend also used numerous technologies including **Elasticsearch**,, and **RESTful** webservices. Spring frameworks were used heavily in particular **Spring boot**, and **Spring MVC**.

2013
2014

Technical Lead & Programmer, McKesson Health Solutions, King of Prussia, PA.
Managed a team of 14 to develop Contract Manager, a contract authoring, contract repository, and contract negotiation suite. The product was built using **Java J2EE** technologies. The team consisted of developers, QA testers, and business analysts. Was responsible for overseeing product's **full life cycle** including requirements gathering, development, technology review, quality assurance, support, and release. Worked heavily administrating and mentoring for the **GIT** source repository including **migration from SVN**. Was responsible for all phone screening and face-to-face interviews. Worked heavily with implementing and integrating **Activiti workflow engine** as new functionality. Proposed and implemented **Apache Jena Semantic Web** technologies for managing metadata throughout the application. Contract Manager ran on **Oracle 10g** database server. Was also responsible for migrating from a **Torque ORM** to **Hibernate JPA** ORM. Also responsible for mentoring the team and conducing all **code reviews**. Hosted weekly classes on programming topics such as **Java collections**, **Java concurrency**, **Graph Theory**, **time complexities**, and many other topics. This position was a 6 month contract to hire, however I was unsatisfied with the company and choose not to continue with the company.

2012
2013

Lead Programmer, Siemens, Malvern, PA.
Worked on a **Linux** package management capable of installing, updating, and configuring packages once installed. Technologies used include **Java** and **Scala** programming languages, **REST** based communication using **Dropwizard**, and **Hibernate JPA** for the database abstraction layer. **Spring** fraeworks were used heavily throughout the stack.

2006
2007

Software Architect & Programmer, FEMA, Virgina.
Developed & Designed FEMA's most mission critical application called **ADD, Automated Deployment Database**. ADD was developed in response to the Katrina hurricane disaster. The software is responsible for determining the logistical deployment of emergency workers during a disaster. At the core it is a **decision engine** which suggested deployment schemes based on the conditions at hand. The project used **Oracle 92g** as the back end, and the **Ibatis** framework. Responsibilities included acting as senior developer on the project consisting of 5 other programmers as well as the being in charge of all **database** responsibilities, in particular writing all the **PL/SQL**. The front end used **Spring**, a **MVC framework**. The contract with the company was only for 3 months; Chose not to renew that contract.

2005
2006

Technical Lead & Programmer, Freewebs, Inc. (now Webs, Inc.), Silver Springs, MD.
This company was started by the old owners of WebOS, a previous employer. Primary responsibilities included design and implementation of **regression analysis** and **statistical analysis** software.

One role in particular was **project lead** for the internal and external usage statistics and analysis software. The system utilized a large collection of **machine learning algorithms** to compute vital information about its users. This information would generate suggestions to improve traffic into specific areas of the site and provide deep analysis of what influences a users decisions. The project used a **PostgreSQL** database and later moved to **Oracle database**. The system had to process over 4 million records per hour in real time and produce in-depth **statistics** on the data. The entire application was written in **Java** using a **J2EE** webapp to display the results. It included an administration tool, also developed using **J2EE**. The daemon portion of the tool, responsible for injecting the statistics into the database, used **XML (JAXP/SAX)** configuration files. **Java-script** and **DHTML** was also used extensively on the front-end. All of which required the **deployment and management of Tomcat**.

A supplementary role was as a **project lead** on a user survey system done in **Java** and **J2EE**. The system automatically generated surveys based on which questions in the database were most relevant to the individual. **Oracle** was used as the database back end.

2003
2005

Technical Lead & Programmer, Boundless, LLC., Philadelphia, PA.
Worked on a **complete life-cycle** 2 year endeavor with 3 programmers to develop a **distributed network** that would efficiently exchange information needed for **genetic algorithms**. The final system was a **client-server network** written in **Java**, using a **MySQL database** and **SOAP communications**.

The most recent work was focused on **image compression** using **Artificial Neural Networks** and **Genetic Algorithms**. Our project resulted in a novel algorithm for lossy image compression that was better then JPEG. Responsibilities included acting as **lead programmer** on the project, which consisted of 5 other programmers and was written mostly in **Java** utilizing some **JNI**. **J2EE** with **tomcat** hosted the user interface for demos of the compression. Was tasked with **deploying and maintaining** the **Tomcat** server.

2001
2003

Software & Hardware Engineer, U.S. Department of Homeland Security, MD.
Worked as a hardware and software engineer implementing a device for **microwave analysis**, the **CS-3001**, a proprietary Microwave Pulse Analyzer developed to analyze microwave signals. The system triangulates the source of a signal, detects intelligent data within a signal, finds hidden signals in the noise floor, and more. Primary responsibility was to implement the **Java swing** graphical interface via an applet hosted on the on board hardware, as well as control the hardware's registers. We implemented the **digital hardware designs** in **VHDL** for the on board **FPGA**. I was also able to contribute to aspects of the analog designs and played a major role in designing related antennas systems. Technologies included **signal processing**, **Cooley-Tukey Fast Fourier Transforms**, **graphing and visualization** using **swing** components. As well as experimental components such as **machine learning** algorithms to detect hidden signals in the noise floor.

2000
2001

Sr. Software Engineer, WebOS, Inc., Columbia, MD.

Lead programmer of Programming.com's **client-server** network using **Oracle database** for the back end. Communication was **encrypted** using a number of **public/private key algorithms**. It was written in **Java**. **UML** was used to design before writing code. It contained a user friendly **AWT GUI**. Also included a critical error **phone notification system**; in case of a system crash it would dial a network of phones and send out E-mail notifications.

Responsibilities also included developing Programming.com's **HTML** front-end. It utilized a newsletter sign-up form, a counter to record user info, and an online **secure** newsletter publication tool all done in **J2EE**. A submission interface allowed recommended links to be automatically submitted and approved.

Volunteering

2009
2013

Tutor, *Advanced Math & Computer Engineering*.

Volunteer in my spare time tutoring college graduates in advanced math, computer science, and electrical engineering.

2009
2010

FIRST Competition, *Electrical, Mechanical, and Computer Engineering*.

Volunteer assisting high school students in the FIRST robotics competition (For Inspiration and Recognition of Science and Technology).

Algorithms & Technologies Invented

dANN	An artificial intelligence and genetic algorithms library which covers a large range of industry standard algorithms including artificial neural networks, graphical models, signal processing, naive classifiers, and much more.
AIDE	An automated inference engine, that includes a distributed server engine as well as an easy to use GUI for administration and processing of data sets.
PIVM	Population injected verhulst model, a mathematical model invented for modeling several types of systems such as spread of ideas via marketing, and word of mouth, as well a disease proliferation accounting for organic spread as well as the effects of travel.
HAM	Hyperassociative Map, a state of the art graph drawing algorithm capable of outperforming other algorithms in its class. The map is often used in distributed big data frameworks.
GW	Genetic Wavelets, a genetic algorithm that has been demonstrated to be superior to traditional genetic algorithms.
NCI	Neurally compressed image, a type of novel lossy compression algorithm noted for its ability to tolerate extreme data loss and still provide optimal data quality for all types of analog data including sound, images, and video.
GAN	Graph affinity network, a mathematical model to simulate key-receptor binding affinities in biological cells. Used as a component in several neural network models.

Public Speaking

2013	Live Web-casts on Artificial Intelligence and Evolutionary Algorithms
2012	Oral Presentation at the Free and Open Source Software Convention (FOSSCON)
2011	Oral Presentation at the Fifth IEEE International Conference on Semantic Computing
2007 - 2009	Lecture Series at Temple University Department of Computer science
2004 - 2006	Lecture Series at Drexel University Department of Computer Science
2002	Interview with Business Week Magazine.
2001	Live Radio Interview with CNET Radio 910 AM San Fransisco.
2001	Interview with Geek.com
2000 - 2001	Series of Live Interviews with CNET News
2000	Series of Live Interviews with CNBC News
2000	Live TV Interview with MSNBC news.

2000 Interview with Fortune Magazine.

2000 Front page interview with USA Today.

Interests

- Organic Chemistry
- Cellular Biology
- Mathematics
- Neuroscience
- Electrical Engineering
- Amateur Radio
- Genetics

Recommendations

May 22, 2015 **Drew Morris**, *Board Member*, Syncleus, Inc..

"Jeff Freeman is an extremely impressive individual. It is a given that he is a brilliant developer and software architect but he is also an innovator. He is one of the most forward-thinking people I know and he is constantly attempting to address the hard problems that few other people are thinking about. Working with Jeff is pleasant, rewarding, and often eye-opening."

January 15, 2014 **Kurt Seidel**, *Business Analyst*, McKesson Health Solutions.

"Jeff has a formidable intellect. He knows his stuff; he cares about quality code and optimization. Not only that- he is a nice guy and willing to share his knowledge. I would hire him for my start-up in a heart-beat!"

July 26, 2013 **Lew Bloch**, *Java Developer*, Syncleus, Inc..

"For a couple of years I worked with Jeff reviewing and commenting on his AI library dANN, and for several months worked side by side with him to get Syncleus off the ground and funded. We had worked together before, at WebOS and various ad hoc projects. His work on dANN is brilliant and hard to duplicate even knowing the code, and the first big practical project eliciting sales opportunities from car dealership records using his AI library created solid results. Jeff has a great blend of entrepreneurial vision and detailed software design and implementation skills."

July 25, 2013 **Michael Griffith**, *Java Developer*, Syncleus, Inc..

"One of the best programmers I've had the pleasure of working with, and a great teacher too. Very personable and an absolute genius!"

June 3, 2013 **Seth Horne**, *Java Developer*, Syncleus, Inc..

"Jeff has designed a mind-blowing array of unique software. Syncleus, the benevolent open-source oriented corporation that he founded, will soon unleash its technology and forever change our future."

February 25, 2013 **Mark Buckman**, *Sr. IT Consultant*, Be2X Information Technology.

"Genius! Jeff is an amazingly clever engineer at crafting solid software solutions. After working nearly 2 decades in the IT industry, I've rarely met an individual with such a breadth of knowledge and technical expertise. Working with Jeff was a pleasurable experience on many levels, as he displayed a dedication not often found in this day and age. His structured and refined approach to problem solving is both a welcome refreshment and an invaluable asset to any technical project."

March 20, 2007 **Shervin Pishevar**, *President*, Freewebs, Inc..

"Jeff is a technical genius. He is one of the smartest scientists that I have ever met. He is going to achieve great things."