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| **Darin DeForest** | |
| 1418 E. Briarwood Terrace Phoenix AZ 85048 703.625.8330 darin@omegasoft.org | |
| **Experience** | |
| Darin DeForest has industry experience in a variety of roles, from program manager to developer of software architecture using the latest developments in computer science, distributed computing, machine learning, computer vision and natural language processing.  Recently, at Ipro Tech, Mr. DeForest developed a distributed, python based, Natural Language Processing system to denoise documents and identify latent topics using machine learning algorithms to help customers understand and navigate e-discovery documents.  At Omegasoft, Mr. DeForest has worked to develop and manage distributed database synchronization for a large China bus transportation system. The development encompassed a wide variety of cloud/web technologies, such as cloud, web application servers, relational and NoSQL databases, and mobile devices.  At Predictive Machines, Mr. DeForest, investigated the use of machine learning and created prototypes into a variety of domains to enhance customers business value and offerings, from collecting images and data from drones and embedded devices, to enhancing medical information flows.  Previously, worked at EuclidIQ in which Mr. DeForest investigated, researched, developed, and patented protected video compression algorithms using machine learning and statistical techniques guided by computer vision algorithms to develop predictive models to enhance video compression.  At Op40, Mr. DeForest worked as lead architect to create a distributed internet middleware application model that distributes and execute internet-based applications using a variety of web-based technology.  Over the course of his work, Mr. DeForest has received various patents related to video object models and distributed middleware. As part of his career he has worked on various innovative technologies, such as detecting credit card fraud, intelligent GUI's, neural networks, Q methodology, firewall and network partitioning at various companies including Motorola, Boeing, American Express, Enron, Interleaf, CSC and CSX.  Mr. DeForest graduated from the University of Maryland with a degree in Computer Science. He went on to Arizona State University, becoming PhD candidate from the Department of Computer Science.  Additional background details and work samples can be reviewed at <https://www.linkedin.com/in/darin-deforest>.   |  |  | | --- | --- | | **Senior Software Engineer** | **2017-present** | | Ipro Tech, Tempe AZ | |   Developed Distributed Natural Language Processing Topic Classification System using python, Microsoft SQL server, Redis, Dask and Elasticsearch over a unstructured document corpus.   * Modified existing python-based Topic Modeling Engine into a higher performance, async based, distributed cluster version using Dask dynamic distributed scheduler. The corpus lemmatization and subsequent topic modeling is done concurrently across multiple clusters/workers/machines. * Converted from the Dask implementation into microservice based Hangfire (background job manager), C# and FastAPI (ASGI) server frameworks. * Created and used python decorators to facilitate timing, memory usage, and enhanced logging. * Created and modified Microsoft SQL Server stored procedures with temp tables, utilized sql queries for analysis, use query planner to fine tune sql performance. * Integrated Prometheus and Grafana monitoring docker stack. * Used pyodbc and Redis to collect data and store intermediate results. * Used Spacy NLP toolkit to perform tokenization, lemmatization, stop word removal, named entity recognition and other denoising filters. * Added denoising filters to identify and remove various Unicode characters, such as 25 types of white space. * Implemented various optimizations such as using aho-corasick string matcher for content filtering and matching, email document sub-sampling. * Used genism NLP python library to generate n-grams, extract topics and subtopics using Latent Dirichlet Allocation. Implemented parallelized version using dask. * Investigated tools to support identifying and masking personal identifiable information. * Used pyinstaller to create exe’s installer package for distribution. * Created distributed test environment utilizing PowerShell for installation, setup and teardown activities. * Created automated testing driven by an excel spreadsheet to specify different jobs and parameterization. * Reviewed and analyzed results based on quality of sanitized/cleaned documents, and the corresponding topics and sub-topics. * Identified Dask and genism GitHub issues and contributed corrections back to these communities. * Worked in agile environment using Jira and git. * Reviewed topic modeling and machine learning improvements based on Natural Language Processing techniques, such as bag of words, word2vec, named entity recognition, co-referencing and disambiguation, open information extraction, social graphs, semantic knowledge base, and technology assisted review. | |
| |  |  | | --- | --- | | **Project Manager/Software Architect (Contract)** | **2013-2017** | | Omegasoft, Phoenix AZ | |   Developed a synchronized distributed infrastructure platform to support Chinese bus transportation in selling and redeeming e-tickets via mobile devices and kiosks.   * Oversaw software architects and developers in defining and coordinating and prioritizing software requirements, tasks, schedules, builds, tests and releases using agile techniques. * Collaborated with external China team in supporting and mentoring them in overall software, configuration, and delivery refinements, identifying test data, implementing automated test data collection, refining existing database schema, performing multi-tier data synchronization, and simplifying deployments into test and production environments. * Created whitepaper, and software architecture and staffing roadmap to include fog/edge base computing for IoT devices. * Architected, developed and managed cloud based high availability, real time distribution and synchronization of database and application infrastructure utilizing couchdb replication to Linux (DB2/ PostgreSQL) and Android clients using Java/NodeJS/Python. Analyzed performance using tpc-c benchmark. * Worked with project stakeholders to define requirements and overall system architecture using Jazz Application Lifecycle Management. * Worked with test team to define test plans and test cases based on software requirements. * Developed devops orchestrated builds and releases by defining SUSE Linux reference platforms for use on Azure, Amazon AWS EC2, NAS, and VMWare vSphere ESXI using Linux BASH scripting with SaltStack for integration and distributed testing. Managed Azure, AWS and vSphere environments as system administrator. * Managed 3rd party build support, i.e. building couchdb, PostgreSQL and other libraries for integration. * Managed git and svn repositories, Bugzilla bug tracking and integrated these into Maven/Headless Eclipse Jenkins continuous build process. * For testing, created SUSE 11 SP3 Hercules s390x emulator docker container to mimic production IBM SystemZ system. Built Hercules and created a SUSE11 SP3 for 390x vm, on which SaltStack and its dependencies for s390x were built. * Integrated software, platform, machine monitoring using Spiceworks, Zabbix with associated plugins and an integrated ELK (Elasticsearch, Logstash, Kibana) stack. * Tested and debugged China web and android applications to ensure correct functionality within ec2 AWS, Azure, VMware vSphere test environment. * Updated distributed tier Java 1.2 code base to Java 1.7 using Eclipse IDE, including adding annotations. * Converted and updated web spring/hibernate servlets from WebSphere/DB2 to JBoss/PostgreSQL to make them portable between environments plus extended them to use microservice service registry. * Debugged HTML/CSS/JavaScript web clients that utilize REST Services, and extracted the REST services into a JMeter test environment. * Configured real-time, continuous DB2 SQL replication, using a rolling date window. * Re-architected client communication protocol from EBJ/RMI interfaces to HTTP JSON REST interfaces using restlet/Jetty. * Created HTTPS SSL termination service using Haproxy to use authentication certificates, and modified various clients (Java, CouchDB, REST) to use HTTPS. * Worked within virtual agile team environment and traveled to Beijing and Chengdu China for product field testing and support.  |  |  | | --- | --- | | **CTO** | **2013-2017** | | Predictive Machines, Phoenix AZ | |  * Worked with customers to understand their business issues/problems that cognitive technology/machine learning can provide improvement. Researched and created proposals and prototypes to demonstrate applicability. * Worked with OpenFlow SDN emulators and hardware to investigate business opportunities for dynamically managing company networks, such as dynamic routes, or identify malicious traffic. * Worked with meteor/mongo/node.js/D3/JavaScript/HTML/CSS to generate a prototype to display visualization of time series data. * Worked with DJI phantom 3 and Matrice 100, DJI mobile SDK, iOS/Android, to generate two POC’s, and distributed to testers using TestFlight to capture and stich images together and perform flight planning via waypoints. * Worked with Nvidia TK1/TX1, Caffe and Torch to process real time image classification for use in autonomous vehicles. * Worked with DJI Matrice 100 with Guidance and Manifold for aerial image classification and object detection for aerial surveys. * Developed proposal to integrate vision recognition and sensor data collection for long term automobile rentals, with options to detect the driver and drivers state. * Worked with biometric Bluetooth heart monitors to collect and classify signals using neural network. * Worked with Python, Jupyter and JupyterHub (in configuring customized docker containers) along with creating notebooks to analyze MIT-BIH Arrhythmia Database using TensorFlow, python, NumPy, panda and sci-kit. * Worked with fluxtream (OSS health and personalization framework) iOS/Android and web based applications. iOS and Android apps use trigger.io framework. * Created clothing demo with Unreal Engine and Microsoft AirSim using C++.  |  |  | | --- | --- | | **Lead Algorithmic Video Software Engineer (Contract) 2002-2013** |  | | EuclidIQ LLC, Concord MA | |  * Worked on video compression algorithms using a variety of image processing, computer vision, machine learning, statistical data analysis and video compression techniques and artificial intelligence algorithms that are the basis of four patents. * Create video feature models based on ransac, k-means clustering, Principle Component Analysis (PCA), SVD, and linear regression using motion vector, color space, surf/shift feature descriptors, and texture dimensions using unsupervised learning. * Created Structure for Motion models for 3D modelling. * Extended x264 encoding to include novel macroblock encodings that were able to get 20% compression over the standard profile. * Developed video codecs using open source and proprietary algorithms using x264, blas, cblas, cmake, ffmpeg, OpenCV, tbb, boost, openmp, and Nvidia cuda using Microsoft Visual C++, Intel C++ compiler, and Apple XCode that can encodes/decodes for Windows and a decoder for iPhone and iPad iOS. * Wrote algorithms that created maximum likelihood estimation search spaces containing video encoding solutions that then were evaluated in parallel, using multiple cores, to determine the solution entropy encoding size. * Wrote memory rollback routines, which were able to allow data to be modified, then rolled back to a prior state as if the data hadn’t been modified. * Wrote object trackers to correlate objects through multiple frames and to project them into the current and future video frames. * Perform analysis of video compression benefit and computational performance on variety of platform including EC2. * Created browser and windows visualization tools to understand the encoding process and selection of solutions. * Wrote plug-ins for MATLAB. * Converted MATLAB code into C++ and verified correctness. * Used VMware ESXi to manage multiple development images and testing environments.  |  |  | | --- | --- | | **Technical Lead Architect (Contract & Permanent)** | **2000-2002** | | OP40, White Plains, NY | |  * Architected and developed a distributed and virtualized J2EE application distribution, deployment, synchronization system that works with JBOSS/Tomcat, iPlanet, WebSphere, and WebLogic. The work with this system produced 9 patents. * Worked on distributed architecture asset collection, transformation and deployment system to work in high latency, low bandwidth connectivity. * Architected and developed an unreliable multicast distribution layer for use over satellite links. * Architected and developed a ORM persistent tier layer that maps a database table into java objects * Architected and developed a database distribution and replication algorithms including mobile devices such as Pocket PC 2002 with traditional Sun, Linux, and Windows platforms. * Support database installation and integration efforts with DB2, Oracle, Cloudscape, HSQLDB, SQL 2000 Server, and SQL 2000 CE. * Mentor team on software development processes, design, architecture, UML, and review designs. * Maintained build process and source control using continuous integration.  |  |  | | --- | --- | | **Technical Lead Architect (Contract)** | **2000-2002** | | **Thinkshed, Austin, TX** | | | * Developed Human Resource analysis application, where applicants were tested for fitness with a company based on their q-sort relationship using statistical modelling. * Developed and defined software development infrastructure processes to include bug reporting, source control, software build, and disaster recovery. * Developed and defined software migration and deployment into QA and production environments, using Linux, Apache, Tomcat and DB2. * Worked with team members to capture and refine software requirements. * Architected and develop web based n-tier software solution using Java, JSP, Javascript, and HTML. * Develop object-relational mapping layer. * Defined database data model and schema, and import, export, and translation utilities. * Reviewed team member designs and made recommendations. * Provided system administration services. | | | **Network Architect (Contract)** | **1999-2000 (6 months)** | | Enron Broadband Services, Houston, Texas | |  * Reviewed InterAgent (a C++ and Java based messaging oriented middleware) that was re-licensed to Sun to use for use as a JMS (Java Messaging System) and made recommendations to improve the design, testing, and packaging of it’s components. * Reviewed broadband network protocols such as RSVP, Directory Enabled Networks (DEN), COPS for integration with a bandwidth broker service that supports advance reservation and quality of service (QoS) over IP networks. * Reviewed and published industry and research information throughout the division using Linux, Apache, WebX (a discussion forum), ipchains (packet filter).  |  |  | | --- | --- | | **Previous Positions** |  | | **Object-Oriented/Web Mentor/Java/Relational to Java/Architect (Contract)** | **1999-1999 (9 months)** | | Fireman's Fund, Austin, Texas |  | | **Object-Oriented Process Mentor (Contract)** | **1998-1999 (8 months)** | | Boeing, Vienna, Virginia | | | **Java/Messaging Developer (Contract)** | **1998-1998 (3 months)** | | Computer Science Corporation (CSC), Falls Church, Virginia |  | | **Web/Java Architect (Contract)** | **1996-1998** | | CSX., Jacksonville, Florida |  | | **Senior Object and C++ Consultant (Contract)** | **1996-1996** | | Ryder Inc., via Technical Resource Connection, Miami, Florida |  | | **Object-Oriented Mentor and C++ Developer (Contract)** | **1994-1996** | | Motorola Inc., Scottsdale, Arizona via Tech-Aid, Scottsdale, Arizona |  | | **Project Manager and Delphi Developer** | **1993-1995** | | WestGroup Management Resource, Scottsdale, Arizona |  | | **Algorithm Reviewer** | **1994-1994** | | John Wiley & Sons, New York, New York |  | | **Senior Prolog Software Engineer** | **1993-1994** | | ReGenisys, Scottsdale, Arizona |  | | **Senior Lisp Consultant (Contract)** | **1993-1994** | | Interleaf, Irvine, California |  | | **C Consultant (Contract)** | **1992-1993** | | Robots, Etc., Tempe, Arizona | | | **C and Video Consultant (Contract)** | **1991-1992** | | American Express, Advance Technology Group, Phoenix, Arizona. |  | | **C Consultant (Contract)** | **1991-1991** | | MicroAge, Tempe, Arizona | | | **Senior Software Engineer** | **1990-1991** | | Motorola Inc., Motorola Computer Group, Tempe, Arizona | | | **Senior Software Engineer** | **1989-1990** | | Motorola Inc., Motorola Cambridge Research Center, Cambridge, Massachusetts | | | **Parallel Computation Research Associate of Computer Science** | **1985-1988** | | Arizona State University, Tempe, Arizona | | | **Teaching Assistant of Computer Science** | **1984-1985** | | Arizona State University, Tempe, Arizona | | | |
| **Articles** | |
| * D. DeForest, A. Faustini, and R. Lee. 1988. Hyperflow. In Proceedings of the third conference on Hypercube concurrent computers and applications: Architecture, software, computer systems, and general issues - Volume 1 (C3P), Geoffrey Fox (Ed.), Vol. 1. ACM, New York, NY, USA, 482-488. <http://doi.acm.org/10.1145/62297.62354> * D. DeForest. *Lucid Bibliography*. Department of Computer Science, College of Engineering & Applied Sciences, Arizona State University, 1986. | |
| * **Summer Fellowships** | |
| **May 1988 – July 1988** Multiprocessor Sequent Research  United States Air Force, Rome Air Development Center, Rome, New York.  **July 1988 – Oct. 1988** Hypercube Research  National Aeronautics and Space Administration, Jet Propulsion Laboratory, Pasadena, CA.  **June 1987** Fortran Vector Processing  NSF Supercomputer Summer Institute, Colorado State University. | |
| **Certifications** | |
| * Structuring Machine Learning Projects, Coursera, Sep 2017 * Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization, Coursera, Sep 2017 * Neural Networks and Deep Learning, Coursera, Aug 2017 * Leading Teams, Coursera, Aug 2017 * Influencing People, Coursera, Jul 2017 * Managing Talent, Coursera, Jun 2017 * Inspiring and Motivating Individuals, Coursera, May 2017 * A developer's guide to the Internet of Things (IoT), Coursera, May 2017 * Image and Video Processing: From Mars to Hollywood with a Stop at the Hospital, Coursera, Apr 2017 * Machine Learning, Coursera, Jan 2014 * Web Intelligence and Big Data, Coursera, Dec 2013 * Software Defined Network, Coursera, Aug 2013 | |
| **Patents** | |
| * [US 7,150,015](http://www.directorypatent.com/US/7150015.html) Dec 2006 [Method and system for deploying an asset over a multi-tiered network.](http://www.directorypatent.com/topic/Method_and_system_for_deploying_an_asset_over_a_multi-tiered_network_1.html) * [US 7,209,921](http://www.directorypatent.com/US/7209921.html) Apr 2007 [Method and system for deploying an asset over a multi-tiered network.](http://www.directorypatent.com/topic/Method_and_system_for_deploying_an_asset_over_a_multi-tiered_network_1.html) * [US 7,685,183](http://www.directorypatent.com/US/7685183.html) Dec 2010 [System and method for synchronizing assets on multi-tiered networks.](http://www.directorypatent.com/topic/System_and_method_for_synchronizing_assets_on_multi-tiered_networks_1.html) * [US 8,326,883](http://www.directorypatent.com/US/8326883.html) Dec 2012 [System and method for distributing assets to multi-tiered network nodes.](http://www.directorypatent.com/topic/System_and_method_for_distributing_assets_to_multi-tiered_network_nodes_1.html) * [US 8,458,142](http://www.directorypatent.com/U2S/20110099256.html) Jun 2012 [Method and system for deploying an asset over a multi-tiered network.](http://www.directorypatent.com/topic/Method_and_system_for_deploying_an_asset_over_a_multi-tiered_network_1.html) * US 8,458,222 Jun 2013 System, method, and data structure for packaging assets for processing and distribution on multi-tiered networks * US 8,473,468 Jun 2013 [System and method for transactional deployment of J2EE web components, enterprise java bean components, and application data over multi-tiered computer networks](http://www.directorypatent.com/topic/System_and_method_for_transactional_deployment_of_J2EE_web_components%2C_enterprise_java_bean_1.html). * US 8,666,933 Mar 2014 System and method for distributing assets to multi-tiered network nodes. * US 8,713,062 Apr 2014 Server system and method for discovering digital assets in enterprise information systems. * US 8,902,971 Dec 2014 Video compression repository and model reuse. * US 9,532,069 Dec 2016 Video compression repository and model reuse. * US 9,578,346 Feb 2017 Model-based video encoding and decoding. * US 9,743,078 Aug 2017 Standards-compliant model-based video encoding and decoding | |
| ***Education*** | |
| |  |  | | --- | --- | | 1988 | Ph.D. Candidate at Department of Computer Science. Arizona State University. Topic: Compiling to a Fine Grain Parallel Dataflow Architecture. | | 1984 | B.S. Department of Computer Science. University of Maryland. Graduated magna cum laude | | 1984 | Gallaudet College, Exchange Student. | | 1982 | A.A. English literature. University of Maryland. | | |
| **Membership in Academic, Scientific, and Professional Societies** | |
| |  |  | | --- | --- | | American Association for Artificial Intelligence | Microsoft BizSpark Partner | | Association of Computing Machinery | Oracle Developer | | IBM Partner | Project Management Institute | | IEEE Computer Society | Apple Developer | | VMUG |  | | |
| **Skills** | |
| |  |  | | --- | --- | | * C++ * C * Visual Studio * BOOST * STL * Intel IPL/MKL * OpenCV * Cmake * OpenMP * FLTK * Intel TBB * Intel C++ * Matlab * Linpack * X264 * FFMPEG * DirectShow * Xcode * iOS * Database Modeling * JMS * JDBC * JBoss/TomCat * WebSphere * PostgreSQL * DB2 * JSP * HTML * Java * Servlet * RMI * XML * CVS/SVN/GIT * TCP IP/UDP * Inno Setup * SuSE * SuSE SMT * DNS/DHCP * MS SQL * OpenVPN * Ethereal * Bash | * JAX-RS * REST * Spring * Hibernate * Spring * Jenkins * Eclipse * Rational Architect * Infosphere Data * Maven * JSON * VMARE * Android * CouchDB * NodeJS * Haproxy * PKI * SaltStack * YAML * AWS/EC2 * Azure * zeroMQ * Zabbix * ELK * JMeter * Ubuntu * Docker * Kvm * Hercules S390 * Meteor * D3 * Javascript * Python * Caffe * Jypter * JypterHub * TensorFlow * Numpy * Panda * Sci-kit * TK1/TX1 Ubuntu * Unreal * ElasticSearch * Spacy * GenSim * Dask * C# | | |