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## Summary

*Experienced Senior Developer with 10+ years of success in AI-driven solutions, secure systems, and scalable development. Skilled in machine learning, predictive analytics, and cutting-edge technologies. Passionate about solving complex challenges and collaborating with innovative teams to advance humanity, technology, and AI through meaningful work.*

## Work Experience

Intelligent Product Solutions (Apr 2017 – Current)  
*Senior Software Engineer*

* Machine Learning Project Desktop App:   
  Technologies: TypeScript, JavaScript, RxJs, Lodash, Pixi, React, Node, Electron, node-gyp, C, C++

Led the design and development of a scalable desktop app for managing machine vision projects. Architected a custom visual component system using Pixi.js for canvas-based project editing with real-time undo/redo capabilities. Integrated C++ communication via a custom Node.js module, enabling real-time data manipulation and streamlined workflows.

* **Bubblegum – Machine Vision Grading System:**

Technologies: Python, Machine Vision (OpenCV)

Developed machine vision algorithms for automated grading of baseball cards, detecting edges, centering, and wear using OpenCV. Demonstrated proof-of-concept feasibility for image-based grading systems, integrating advanced library features for high-accuracy analysis.

* **RFID Surgical Table Interface:   
  Technologies:** C, TypeScript, Socket.IO, Express.js, Node.js, node-gyp

Created a custom C driver for RFID scanners with Node.js integration to enable real-time surgical instrument tracking. Implemented lightweight Express and Socket.IO communication layers to relay scan data dynamically. Delivered a robust UI for live grid-based tracking and demonstrated early-stage neural network capabilities for tag triangulation.

* **Smart Lighting Solution Connectivity Bridge:   
  Technologies:** TypeScript, Node,js, Express.js, MongoDBDesigned and developed an IoT smart lighting control system using Express.js and MongoDB. Implemented robust API functionality for device grouping, state management, and streamlined OTA firmware updates. Delivered key features that directly contributed to the product’s acquisition by Ring.
* Smart Piano App and Service:   
  Technologies: Swift, RxSwift, Java, STOMP protocol, GStreamer, AWS Kinesis   
  Overhauled GStreamer/Kinesis pipelines to eliminate a 90-minute streaming cap, enabling extended live performances for a high-profile smart piano system. Updated libraries and hardware integration for stable operation during concerts. Enhanced GStreamer pipelines with features like screen rotation and real-time audio/video sync. Migrated core Swift components to RxSwift for improved responsiveness and state management across multiple connections. Optimized a Java backend to support real-time performance messaging with the STOMP protocol.
* Online Education Portal:   
  Technologies: JavaScript, React, Redux, Node.js, Express.js, Reddis

Developed front-end tools for a searchable K–12 curriculum database, including advanced filtering/sorting features to enhance educator efficiency. Implemented Redux for consistent state management and seamless global data flows. Integrated and customized an open-source PDF reader to enable in-platform annotation and highlighting. Optimized the portal for responsive performance across diverse screen sizes and devices.

* **Reverse Engineering for Software Activation:   
  Technologies:** Reverse Engineering, IDA Pro, Ghidra  
  Reverse-engineered a business-critical application to reactivate expired licensing files, ensuring uninterrupted client operations. Preserved the client’s investment by restoring functionality after the original developer became unavailable. Demonstrated rapid mastery of reverse engineering techniques under high-stakes conditions.
* **Blood Donor Portal:   
  Technologies:** React, Typescript, Node, RxJs, AWS Serverless, Lambda, API Gateway  
  Led the development and architecture of a scalable Blood Donor Portal. Designed and implemented a React-based UI for donors, ensuring an intuitive and seamless experience. Architected the AWS serverless backend (API Gateway, Lambda) to support dynamic requirements and automagically deploy portal instances for clients. Developed front-end project architecture and APIs, aligning UI and serverless logic for consistent performance. Built CI/CD pipelines for rapid, reliable deployment, maintaining full-stack alignment with evolving donor and business needs.
* Security Alarm System:   
  Technologies: JavaScript, C#, APS.NET MVC  
  Implemented a multi-step configuration wizard for an alarm system, modernizing the user setup process within a legacy codebase. Adapted existing pages/routing and overcame challenges of a secured jump server in a fragmented environment. Helping fellow developers integrate wizard steps, ensuring an on-time rollout of the new setup flow. Simplified end-user onboarding and mitigated complexity in the underlying legacy system.
* Temperature Monitoring IoT Device:   
  Technologies: React Native, Javascript, RxJs  
  Developed a cross-platform React Native app for real-time IoT temperature monitoring on iOS and Android. Built a reliable polling system for frequent temperature updates, ensuring accurate, up-to-date data. Optimized the device configuration UI for improved usability and performance. Published the iOS version to the App Store on an accelerated timeline.
* Stock Analysis App:   
  Technologies: Pyhon, Flask, Numpy, Pandas  
  Designed and implemented backend tools for analyzing stock trading patterns, capturing real-time open/close prices and volume data.Built an automated pipeline to fetch large lists of tickers, parse metrics, and push data to a Python-based web framework for visualization. Optimized the system for scalable data handling, enabling daily batch updates without downtime.
* Patient Management Portal:   
  Technologies: Angular, Micro-Frontend Architecture, RxJs, Redux  
  Developed and integrated a patient lookup micro-frontend within a scalable healthcare system. Built a real-time memory graph utility for visualizing allocation and timeline data, enhancing troubleshooting efficiency. Leveraged modern Angular features to ensure clean, maintainable code across multiple micro frontends, supporting seamless system integration.
* Mau App Development:   
  Technologies: Xamarin, Maui, C#   
  Modernized a mobile application by transitioning from Xamarin to Maui, addressing compatibility challenges and improving cross-platform performance. Enhanced layouts and formatting for consistent and optimized user experiences. Delivered critical bug fixes and new features to meet evolving project needs.
* **Client Collaboration & Team Contributions:** 
  + Led requirements-gathering sessions with clients, refining project goals and translating them into actionable development plans.
  + Partnered with customers during design and development, offering innovative solutions to improve functionality and user experience.
  + Delivered regular client updates, ensuring alignment, transparency, and timely delivery of milestones.
  + Mentored junior developers, fostering skill growth in technical areas like machine learning and secure system design.
  + Collaborated across Scrum ceremonies to provide feasibility analyses, break down features, and deliver comprehensive bottoms-up estimates.
  + Played a key role in product development, suggesting alternative approaches, weighing pros and cons, and driving successful implementation.

*Cybersecurity Lead (Concurrent)*

* Established and led the **Cybersecurity Pillar**, developing service offerings such as penetration testing, vulnerability assessments, and security training.
* Conducted penetration testing engagements, discovering critical vulnerabilities, and delivering actionable reports with risk assessments and remediation strategies.
* Designed and implemented Red vs. Blue simulation events to test defenses and enhance readiness for internal and client IT teams.
* Championed a security-first mindset through technical mentorship and the development of interactive workshops.
* Partnered with clients to define cybersecurity needs, align solutions with organizational goals, and ensure successful adoption of security practices.
* Delivered presentations and training sessions to internal teams and client organizations, enhancing cybersecurity awareness and readiness.

Viventium (Jun 2015 – Jan 2017)  
*Software Developer*Technologies: Typescript, Angular, Protractor

* Architected and implemented a Protractor-based framework for end-to-end testing of Angular applications, ensuring flexibility and scalability across multiple product releases.
* Developed reusable PageObject models to streamline automated testing and improve maintainability.
* Integrated the testing framework with TeamCity, enabling continuous integration pipelines for automated feedback and reliability.

Intelligent Data Systems (Jul 2014 – May 2015)  
Software Developer  
Technologies: ASP.NET MVC, C#, and SQL Server

* Developed and maintained features for the Academy Bus Website using ASP.NET MVC, C#, and SQL Server, delivering high-quality functionality in a production environment.
* Implemented dynamic front-end components with Angular and Bootstrap, ensuring seamless integration with backend services to enhance user experience.
* Created and optimized stored procedures to support new business requirements and improve database performance.
* Integrated Google Maps API to deliver an interactive vendor mapping system, enabling real-time location visualization and improved usability.
* Provided rapid production support by delivering emergency patches and resolving critical issues within tight deadlines.

## Featured Personal Projects

Athena Developer AI Framework

**Technologies: P**ython, NLP, Hugging Faces, React

* Developed a secure, offline NLP solution for real-time QA, leveraging dual pipelines (extractive and generative) for precision and adaptability.
* Automated data parsing from unstructured formats (e.g., PDFs, Word) into structured datasets for training and analysis.
* Designed to run entirely on local hardware, ensuring strict data confidentiality for enterprise clients.
* Connected with systems like JIRA, SharePoint, and Confluence to create a unified knowledge source, significantly reducing onboarding times and enhancing developer productivity.

Kepler Prediction Engine  
**Technologies:** Python, Graph Theory, NLP, AI Models

* Built a graph-based system to map business relationships and rank high-value leads using AI-driven analytics.
* Enriched LinkedIn data with structured attributes like industry, location, and size, enhancing predictive accuracy.
* Introduced a checkpointing system for resilience in long-running data crawls and outlined plans for semi-supervised optimization using graph neural networks.

**Apollo Predictive Analytics System**  
**Technologies:** Python, scikit-learn, Feature Engineering

* Created a machine learning model with 90% accuracy for predicting contract success, integrating temporal and behavioral insights.
* Designed an automated experimentation framework to refine models overnight, accelerating system optimization.

PreReq Requirements Extraction System  
Technologies: Python, NLP, SpaCy, POS Tagging, Regex

* Designed an NLP pipeline to extract actionable requirements from unstructured text, saving hours of manual effort in project management workflows.
* Normalized semantically similar verbs using verb mapping for consistent output and clarity.
* Implemented dependency parsing inspired by slot grammar principles to ensure traceability and priority categorization for project stakeholders.
* Integrated MoSCoW prioritization to automatically sort requirements by urgency and importance.

IBM Watson Slot Grammar Parser

**Technologies:** Java

* Independently studied IBM Watson’s Slot Grammar approach, implementing fundamental parsing techniques for sentence analysis.
* Delivered a proof-of-concept parser capable of analyzing basic sentence structures, laying groundwork for more advanced NLP frameworks.

**Gaussian Mixture Visualization Demo**  
**Technologies**: JavaScript, Java Servlets

* Created an interactive tool to visualize Gaussian Mixture Models, showcasing unsupervised learning principles in real time.
* Designed a seamless interface combining JavaScript with Java Servlets for computational processing.
* Enhanced user interactivity by dynamically shifting red/blue distributions during the model's learning process.

**Nearest Neighbors OCR Demo**  
**Technologies:** JavaScript, jQuery, MNIST Dataset

* Developed a web-based OCR tool using the Nearest Neighbor algorithm, providing real-time classification of user-drawn digits.
* Integrated a canvas input for dynamic digit drawing, demonstrating algorithm flexibility with live feedback.

**Recommendation Engine for Reddit**   
Technologies: Java, Bayesian Models

* Developed a Bayesian recommendation engine to predict user interest in Reddit links based on interaction metrics.
* Trained on user data to deliver personalized recommendations with high precision.
* Demonstrated Bayesian methods for content filtering, reinforcing practical ML knowledge.

**Zombie GPS Game**  
Technologies: Java, Android, Google Maps API

* Designed a real-time GPS-based mobile game where zombies dynamically track the player’s location.
* Integrated Google Maps with Android’s location framework for interactive zombie positioning and live updates.
* Delivered an engaging proof-of-concept demonstrating mobile game mechanics and location-based services.

## ****Technical Competencies****

* **Languages:** Python, JavaScript, C#, C++, TypeScript, Java
* **Front-End:** Angular, React, React Native, Electron, RxJS, Redux
* **Back-End:** Node.js, ASP.NET MVC, Express
* **Databases:** MongoDB, MySQL, SQL Server
* **AI/ML:** scikit-learn, TensorFlow, PyTorch, Hugging Faces, SpaCy**,** Predictive Analytics, Data Preprocessing, Feature Engineering
* **DevOps & Tools:** Git, Docker, GStreamer, Experience contributing to CI/CD Pipelines
* **Security:** CEH, Penetration Testing, Vulnerability Assessments, Secure System Design, Red vs. Blue Team Exercises, Reverse Engineering (IDA Pro, Ghidra), Burp Suite, Nmap, Metasploit Framework, Wireshark, Nessus, OWASP ZAP, Sqlmap, Hydra, Aircrack-ng, John the Ripper, Netcat, Hashcat, Enum4linux
* **Cloud & IoT:** AWS (Lambda, API Gateway, S3, CloudWatch), IoT Development, IoT Sensor Networks
* **System Design:** Scalable Architectures, Micro-Frontend Architecture, Graph-Based Systems, Secure Offline Frameworks, Real-Time IoT Systems
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**Education**

Stony Brook University

Bachelor of Science in Computer Science (2011)

* Emphasis on AI, Machine Learning, and Software Engineering Principles.
* Relevant coursework: Internet Programming, Intermediate Programming in C & C++, Electronic and Computer Engineering.
* Additional focus on Applied Mathematics and Statistics (AMS), with coursework in statistical modeling, numerical analysis, and data optimization.

Certifications

* Certified Ethical Hacker (CEH)
* Coursera – Stanford Machine Learning Specialization (In Progress)