# Anthony P. DeLuca anthony@anthony-deluca.com | (631) 521 – 1346 | www.anthony-deluca.com

## Summary

*Versatile senior developer with 10+ years of experience delivering scalable AI-driven solutions and secure systems. Proven track record of leading complex projects in machine learning, NLP, and predictive analytics, leveraging cutting-edge technologies like Hugging Face Transformers and CUDA for advanced performance optimization. Passionate about system design, empowering teams, and building tools that bridge innovation with business impact.*

## Work Experience

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

* Machine Learning Project Desktop App: 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:** 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:** 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:** Designed and implemented an Express.js API and database system for IoT smart lighting controls. Enabled device grouping and state management with MongoDB and streamlined over-the-air (OTA) firmware updates. Contributed critical features that facilitated the product’s acquisition by Ring.
* Delivered high-impact solutions across machine vision, IoT, and full-stack systems with a focus on technical leadership and scalability

*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.

Viventium (Jun 2015 – Jan 2017)  
*Software Developer*

* 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

* 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.

## ****Key Skills****

* AI/ML: Machine Learning (scikit-learn, TensorFlow, PyTorch), NLP (Hugging Face Transformers, SpaCy), Predictive Analytics, Data Preprocessing, Feature Engineering.
* **Full-Stack Development:** React, Angular, Node.js, TypeScript, Python, C#, Java, Electron, Express.js, GraphQL.
* **System Design:** Scalable Architectures, Micro-Frontend Architecture, Graph-Based Systems, Secure Offline Frameworks, Real-Time IoT Systems.
* **Performance Optimization:** CUDA, GPGPU Programming, Multithreading, Real-Time Processing.
* **Security:** Testing (CEH Certified), Vulnerability Analysis, Secure System Design, Red vs. Blue Team Exercises.
* **Technical Leadership:**
  + Driving architecture and design for scalable systems.
  + Leading development of high-impact projects with cross-functional collaboration.
  + Mentoring developers in advanced coding practices and modern technologies.
* **Tools:** AWS, Docker, Kubernetes, CI/CD Pipelines, MongoDB, SQL, node-gyp, Valgrind, GDB.

## Featured 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.

## Projects

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.

**Clinical Trial Matching System**  
Technologies: **Java, Hibernate**

* Built a system to match patient chief complaints with suitable clinical trials, leveraging structured data searches.
* Experimented with matching logic to improve relevance and efficiency of trial recommendations.
* Laid the groundwork for a scalable trial-matching engine, enhancing patient-clinical alignment.

**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
* **AI/ML Frameworks:** scikit-learn, TensorFlow, PyTorch, Hugging Face
* **Front-End:** Angular, React, React Native, Vue, Bootstrap
* **Back-End:** Node.js, ASP.NET MVC, Flask, Express
* **Databases:** MongoDB, MySQL, SQL Server
* **DevOps & Tools:** Git, Docker, TeamCity, Jenkins, CI/CD Pipelines
* **Security:** CEH (Certified Ethical Hacker), Penetration Testing, Vulnerability Assessments
* **Cloud & IoT:** AWS (Lambda, API Gateway), IoT Development

**Education**

Stony Brook University

Bachelor of Science in Computer Science

* 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)**