ANDREW CHARNESKI

AI Research Engineer

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 • GitHub
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Executive Summary

Senior AI Platform Engineer with 20+ years of experience designing and building robust, scalable machine learning systems. Specializes in high-performance JVM-based ML, GPU acceleration, and creating innovative developer tools that bridge the gap between AI research and production environments. Author of multiple open-source AI frameworks and tools, including an IntelliJ plugin with over 57,000 downloads. Proven ability to translate theoretical concepts into practical, enterprise-grade AI platforms.

Core Competencies

- JVM-Based AI Systems: Expert in building and optimizing high-performance AI/ML platforms in Java and Kotlin, with deep expertise in GPU integration (CUDA/OpenCL) and memory management.
- AI Developer Tools: Architect of the Cognotik AI platform and IntelliJ plugin (57k+ downloads), creating tools that enhance developer productivity with a privacy-first, user-controlled architecture.
- Scalable ML Architecture: Designing and implementing end-to-end ML systems, from custom neural network frameworks (MindsEye) to distributed data processing pipelines.
- Fundamental Algorithm Design: Creating and analyzing novel optimization algorithms (QQN, RSO) and neural architectures from first principles.
- Open Source Research Leadership: Authoring and maintaining 70+ open-source repositories and

- research platforms (MindsEye, Cognotik), fostering community and transparent validation.
- Enterprise Integration: Proven track record of deploying solutions in large-scale enterprise environments (Grubhub, Expedia), including security, monitoring, and operational intelligence.
- Full-Stack AI Applications: Experience building full-stack applications (React/Kotlin) that leverage LLMs to solve real-world business problems.
- **Theoretical Modeling**: Developing mathematical and philosophical frameworks for agentic systems, cognitive architectures, and geometric AI.
- Anticipatory Research: A consistent track record of identifying and developing solutions for key industry challenges ahead of mainstream adoption.

Professional Experience

Senior Software Engineer

Oct 2018 - July 2025

Grubhub

Remote/Westerville, OH

- Developer Experience AI: Pioneered and built agentic AI systems to automate troubleshooting and operational intelligence, directly improving developer and operator workflows.
- Full-Stack DevTools: Architected and delivered a full-stack application (React/TypeScript + Kotlin/Spring) leveraging LLMs to analyze Jenkins build failures, enabling self-service diagnostics.
- JVM Performance Tuning: Led deep-dive performance analysis of critical JVM-based services, achieving significant throughput improvements and cost savings through advanced profiling and optimization.
- Deployment Orchestration: Designed and built a sophisticated, multi-stage deployment orchestration tool with automated canary analysis, rollback capabilities, and comprehensive audit trails, increasing deployment safety and velocity.
- Open Source Integration: Maintained and enhanced core open-source platforms (Apache Ranger, Azkaban) to meet enterprise requirements, contributing patches upstream.

Software Consultant 2012 - Oct 2018

Technical Consulting (Expedia, Amazon, HBO, Plugged-In Technologies, Big Fish Games)

Seattle, WA

- At Expedia, led cloud migration of big data infrastructure (Hadoop to AWS/Qubole) and designed a high-performance real-time ads targeting system (~10k tps, TP95 <5ms).
- At Amazon, led productionalization of a Java web service for decision support and developed real-time DDoS detection systems.
- At HBO, reduced cpu and memory load by 90% through critical bug fixes and developed static code analysis tools for large-scale code cleanup.
- At Plugged-In Technologies, created a cross-platform video conferencing app with advanced features like screen sharing and recording.
- At Big Fish Games, developed an Android video game streaming client with real-time video processing capabilities.

Team Lead / Senior SDE / SDE II

Early 2000s - 2011

Earlier Career

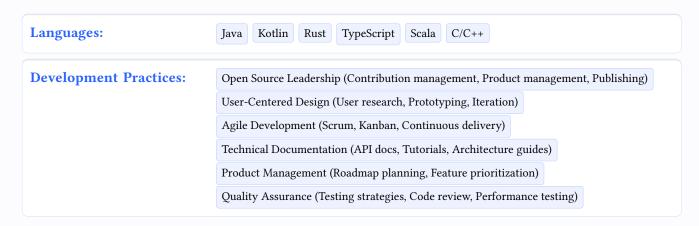
Various

- **Distributed Energy Management**: Led a team of six and architected a high-performance time series data service and analytics platform.
- Amazon.com: Created a distributed real-time data reporting service and developed Apache httpd C modules for routing and security.
- Marchex: Designed a MySQL partitioning service and maintained a GWT web application.
- **Aristocrat Technologies**: Developed C# .NET commercial business applications for the gaming industry.

Publications & Open Source

- Cognotik Agent Platform (2022-Present) (AI Agent Platform & IDE Plugin) Open-source AI agent platform with a desktop app, IntelliJ plugin (57k+ downloads), and web interface. Features a 'Bring Your Own Key' (BYOK) architecture for user control and privacy. Implements novel approaches to human-AI collaboration and multi-modal cognitive architectures.
- MindsEye Neural Network Framework (2015-2021) (Deep Learning Library) A comprehensive, component-oriented deep learning library in Java with advanced GPU acceleration (CUDA/OpenCL), novel optimization algorithms (QQN, RSO), and a revolutionary hybrid memory management system. Contains sophisticated experimental optimization algorithms. Pioneered Test-Driven Development for neural networks.
- Fractal Thought Engine (2024-Present) (AI Research Journal) An experimental research journal and platform exploring AI consciousness and human-AI collaboration. Features 168+ articles on agentic design, optimization, and AI consciousness.
- Optimization Algorithm Research (QQN) (Research & Paper) Developed Quadratic Quasi-Newton (QQN), a novel optimization algorithm achieving a 72.6% win rate across 62 benchmark problems vs traditional methods. Published with a comprehensive Rust-based benchmarking framework.
- DeepArtist Platform (2018-2021) (Neural Art Platform) Experimental neural style transfer artistic platform. Pioneered 'kaleidoscopic preprocessing' to achieve perfect mathematical symmetry in neural art across Euclidean, Spherical, and Hyperbolic geometries.
- Test-Driven Development for Neural Networks (*Methodology*) A two-part series establishing methodologies for unit testing and A/B testing in AI development.
- Modeling Network Latency (Statistical Analysis) A statistical analysis of network latency distributions for distributed systems.
- Volumetry & Probabilistic Modeling (Research) Research on multidimensional probability modeling using decision trees and gaussian kernels.

Technical Skills



Education

University of Illinois at Urbana-Champaign

Bachelor of Engineering in Physics \cdot Minor in Mathematics

