

ANDREW CHARNESKI

AI Research Engineer

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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

Grubhub

Oct 2018 – July 2025

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

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

2012 – Oct 2018

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

Earlier Career

Early 2000s – 2011

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

Languages:

Java

Kotlin

Rust

TypeScript

Scala

C/C++

Development Practices:

Open Source Leadership (Contribution management, Product management, Publishing)

User-Centered Design (User research, Prototyping, Iteration)

Agile Development (Scrum, Kanban, Continuous delivery)

Technical Documentation (API docs, Tutorials, Architecture guides)

Product Management (Roadmap planning, Feature prioritization)

Quality Assurance (Testing strategies, Code review, Performance testing)

Education

University of Illinois at Urbana-Champaign

Bachelor of Engineering in Physics · Minor in Mathematics

