

Michael McGarrah

Engineering Leader | Enterprise Architecture · AI/ML · Cloud Platforms

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Career Profile

Technology leader with 30+ years bridging enterprise architecture, AI/ML, and cloud platforms. Career spans engineering leadership (IT Director, Development Manager), enterprise architecture (statewide technology standards for North Carolina state government), and hands-on platform engineering (AWS, EKS, production ML models). Security and compliance depth includes passing IRS SafeGuard audits, leading SOC 1/SOC 2 compliance across eight simultaneous audits, and serving on a Congressional subcommittee (ETAAC) reporting to Congress on technology and security policy. Currently completing an Executive MBA at UNC Wilmington, deliberately complementing technical depth with business strategy and organizational leadership.

Education

Executive Masters of Business Administration

University of North Carolina Wilmington

2025 - present

GPA: 4.0

Pursuing an Executive MBA with a focus on Corporate Entrepreneurship, deliberately complementing 30+ years of technical depth with business strategy, finance, and organizational leadership. Applying coursework directly to technology adoption decisions, ROI analysis for platform investments, and organizational change management for AI/ML initiatives. EMBA Candidate — Expected Graduation: Spring 2027

Masters of Science in Computer Science

Georgia Institute of Technology

2014 - 2019

GPA: 3.63

Completed a five-year graduate program while working full-time — a deliberate investment in AI/ML depth that required sustained discipline across evenings, weekends, and years of compressed personal time. Specialization in Interactive Intelligence with coursework spanning machine learning, perception systems, natural language processing, computer vision, and knowledge-based AI. A cross-domain research collaboration with a PhD candidate in sociolinguistics produced a peer-reviewed publication in the Nordic Journal of Linguistics (2021) and a conference presentation at NAWA 46 — demonstrating how applied CS and ML skills serve as a force multiplier for domain experts in other fields.

Bachelor of Science in Computer Science

North Carolina State University

1990 - 2011

GPA: 3.42

Completed a Bachelor of Science in Computer Science graduating with Honors while working full-time and raising a family.

Experience

Lead Principal Engineer (Cloud & ML Focus)

Investnet, Inc., Emerald Isle NC (Remote)

Oct 2021 - Present

Leading cloud platform architecture across 20+ AWS accounts spanning every billing and data platform in the enterprise. Recovered a critical cross-enterprise data engineering project under pressure, then served as technical advisor to the engineering team on AWS data pipeline architecture — accelerating delivery by leveraging prior BCBSNC experience with similar patterns. Founded and led the cross-team EKS Working Group, driving Kubernetes architecture decisions and building an enterprise community of practice through influence rather than mandate. Built the observ-

ability framework (New Relic with Confluence-linked runbooks and Terraform-provisioned dashboards) that became a company-wide standard. Led SOC 1/SOC 2 compliance from a single inaugural audit to eight simultaneous audits across all products, automating evidence collection and serving as primary technical liaison to external auditors. Delivered the first AI/ML production workload on the Billing platform (AWS Bedrock Data Automation). Drove measurable cost optimization through EKS right-sizing, scale-to-zero workloads, and Karpenter migration.

- Investnet upSWOT
- Investnet Data & Analytics

Principal Data & Analytics Platform Engineer

Apr 2019 - Oct 2021

Blue Cross and Blue Shield of NC, Raleigh-Durham NC (Remote)

Architected and led development of the enterprise data science platform — multi-account AWS infrastructure (EKS, EMR, RDS, Lambda), containerized ML execution environment, and CI/CD pipelines — powering production deep learning models processing claims data from all NC members, emergency rooms, and hospitals under near-real-time requirements. Operated with director-equivalent authority: conducted performance reviews, drove salary increases, executed performance improvement plans, led hiring, and dotted-line reported to the SVP. Managed cost controls across the EKS platform and the team of platform engineers building it — spot-instance and GPU-enabled node groups with scale-to-zero scheduling, activity-based cost tracking, and remediation workflows for developers and data scientists provisioning AWS resources. Delivered the Medicare Guided Selling system as a fast-track serverless deployment (Lambda, API Gateway, DynamoDB) to meet an SVP-driven timeline before the full platform was ready. Built the CarePath ML framework that produced award-winning models for Complex Case Management (ISSIP Excellence in Service Innovation Award), Hospital-to-Home transitions, and cardiovascular/diabetes risk prediction.

- Medicare Guided Selling

Data Engineer

Nov 2017 - Apr 2019

United States Postal Service, Raleigh NC

Administered a 25-node SAS Viya in-memory analytics cluster (26TB RAM) with connectivity to a 50+ node Hadoop data lake approaching 1PB, operating on a closed network under NIST 800-53 high security controls with DEA data hosted. Worked directly with the USPS Chief Data Scientist and his team of data scientists, providing platform engineering, data engineering, and machine learning infrastructure support — including building custom data acquisition modules that gave the data science team access to production-quality geospatial and operational datasets they couldn't obtain from existing sources. Stabilized platform operations, built CISO-compliant administration automation (Python Fabric, Ansible), and constructed a complete Hadoop development platform replicating production for upgrade planning.

Cloud Architect

Jul 2016 - Sep 2017

American Kennel Club, Raleigh-Durham, North Carolina Area

Served as cloud evangelist bringing AWS into an organization that was entirely data-center and vendor-hosted, overcoming significant resistance from data center engineers who feared cloud adoption would eliminate their roles. Coached the existing engineering team through the transition — demonstrating that cloud is infrastructure with automation built in, not a replacement for engineers, and that upskilling into scripting, IaC, and automation was the path to staying relevant. That investment in people was as critical to the migration's success as the technical architecture. Built the AWS platform from nothing to a fully functional managed environment hosting AKC's primary website and marketplace. Completed zero-downtime migration of akc.org in six weeks and marketplace.akc.org in two weeks, reducing hosting costs from \$30,000/month to under \$5,000/month while improving uptime and response times. Designed and implemented a complex three-way Active Directory synchronization across AWS, the on-premises AKC data center, and Office 365. Led application modernization from legacy ColdFusion and Perl to a MEAN stack with end-to-end CI/CD.

Enterprise Architect for Strategic Initiatives

May 2015 - Jul 2016

North Carolina Department of Information Technology, Raleigh NC

Led enterprise-wide technology strategy for North Carolina state government in a dynamic environment with four direct-manager transitions, including a period of six months reporting directly to the State CIO (future Secretary of IT). Authored the Request for Information (RFI) for statewide data center network modernization and co-authored the Request for Proposals (RFP) with the State Risk Officer for a security standards rewrite based on NIST and DoD frameworks. Evaluated and responded to RFCs, policy and controls requests, and led program management for cloud technology adoption across Azure, OpenShift, and direct AWS engagement. Leveraged deep cross-agency relationships built over years as a state employee (NC DOR, UNC System, Community Colleges) and worked closely with the CISO on compliance and security initiatives — cross-domain knowledge from IRS audit and security background proved essential for moving programs and projects forward across organizational boundaries.

Senior Systems Programmer & Administrator (AI Technologies)

Apr 2013 - Jul 2015

Measurement Incorporated, Durham, NC

Originally hired to build data center infrastructure for an ML moonshot project — automated essay assessment for school system end-of-year exams — and rapidly pivoted to an AWS-hosted solution. Built a custom scalable compute and monitoring platform with a team of engineers that scaled to thousands of first-generation spot EC2 instances for ML scoring workloads, then scaled down. Owned all costs and cost controls across the platform (FinOps before the term existed). Scope expanded from systems administrator to systems programmer to cloud architect to machine learning engineer: optimized low-level ML libraries (CBlas, LPSolve, Shogun), ported the ML Toolkit to native Windows, and contributed patches back to open source communities. Also built a private cloud platform (Eucalyptus 3.4 replicating AWS services) with iSCSI shared storage for on-premises workloads. Concurrent with Georgia Tech MS coursework in machine learning — SVP Dr. Kirk Ridge provided the recommendation letter and support that enabled entry into the OMSCS program.

Systems Administrator

Aug 2011 - Mar 2013

SAS Institute, Inc., Cary, NC

Administered validated systems for the pharmaceutical industry under FDA CFR Part 11 compliance — not standard systems administration but validated systems administration where every action is auditable, every installation documented, and every change request traceable for federal audit. Designed multi-tier SAS architectures for 80+ customers in unique configurations, including the first production Disaster Recovery capable multi-tier SSO system for a clinical trial customer (7 servers + 8 load-balanced terminal servers). Automation-first approach using Puppet, scripting, and SAS product customization to ensure consistency across validated environments. Completed all six available SAS certifications in six consecutive months — one per month, the fastest anyone had accomplished this in any division at SAS: Platform Administrator, Base Programmer, Clinical Trials, Data Integration, BI Content Developer, and Statistical Business Analyst.

Application and Network Security Specialist

Mar 2007 - Aug 2011

NC Department of Revenue, Raleigh NC

Grew from firewall administrator to policy and controls leader over four years, rapidly expanding security scope from IC work to contributor on nationwide projects and multi-state initiatives. Skip-level reported to the Secretary of Revenue for half the tenure, taking direction from the top tier of the organization. Part of the five-person team that passed the IRS SafeGuard audit — a seven-month preparation producing a 1,300-page report covering all IT infrastructure, with no noteworthy findings (acknowledged by IRS auditors as a significant achievement). Loaned to the IRS for Congressional subcommittee work (ETAAC) developing third-party tax preparer security standards based on NIST 800-53 controls adapted to IRS Publication 1075. Integrated security reviews into every step of the SDLC, reducing rework costs and improving PCI and IRS compliance. Applied NIST 800-53, FISMA, FIPS 140-2, PCI-DSS, and ISO/IEC 27002 frameworks.

Congressional Subcommittee Member

Mar 2009 - Mar 2011

ETAAC Security Subcommittee, Washington DC

As a member of the Electronic Tax Administration Advisory Committee (ETAAC) subcommittee on computing security, I provided significant input into third-party tax preparer security standards based on a subset of the moderate level controls from NIST 800-53. This furthered the mission of the ETAAC who reports to Congress annually provides for discussion of electronic tax administration issues in support of the goal of paperless filing. The final Congressional report applied these controls as a baseline for this industry. [2009 ETAAC Annual Report to Congress](#)

IT Engineer (IT Director)

Mar 2006 - Mar 2007

BD Biosciences, Durham, NC

IT Director for the BD Treyburn manufacturing plant — sole IT leader managing all IT services, budgets, and one direct report with dotted-line reporting to the BD CIO and direct reporting to the plant manager. Owned costs and financials for all IT operations. Navigated a complex environment spanning an Apriso MES implementation with custom Oracle/SAP integrations, Genesis SAP deployment, phone system and network replacement, and medical device standards compliance. Led the Windows NT domain to Active Directory migration and SMS 2003 deployment. Integrated Allen & Bradley ControlLogix PLCs with manufacturing floor automation systems. Leveraged Lotus Notes and Domino experience from Ziff-Davis to manage BD's email and collaboration platform for 200+ users. Trained in BD Project Management Mastery (PMM) and Six Sigma. Built on the multi-site management experience from NC LIVE to lead a manufacturing plant IT operation in a regulated industry.

Early Career — Systems Engineering & Software Development

1990 – 2005

Fifteen years of progressive technical roles spanning systems programming, UNIX/Windows administration, database management, network engineering, and development management. Key positions included:

- **Systems Programmer** — NC Community College System (2005–2006): Administered Solaris and AIX systems for all 58 NC community colleges; led the Solaris 9 upgrade project; built automation reducing manual effort across 58 sites.
- **Systems Engineer** — Hosted Solutions (2004–2005): Senior off-shift supervisor across three data centers; enterprise storage management (BakBone NetVault) for 200+ customers.
- **UNIX Engineer** — NetIQ/Ganymede Software (2002–2004): Built API-driven lab automation (VMware ESX, PXE, multi-OS network boot) predating cloud computing; cross-platform UNIX/Windows product development.
- **Systems Programmer II** — NC State University (2000–2002): Financial systems (Sybase), open source initiatives (Realm Linux), RHCE certification.
- **Development Manager** — NC State University / NC LIVE (1999–2000): Led statewide digital library platform serving all NC public libraries and universities; tripled service providers in 12 months; presented at EDUCAUSE 1999.
- **Benchmark Developer** — SAS Institute (1994–1998): Performance benchmarking across 14 UNIX platforms; Six Sigma greenbelt; infrastructure upgrade planning.
- **Technical Services Manager** — Pioneer Software / Q+E Software (1992–1994): Managed international technical support staff of fifteen; OEM contact for 130+ customers including IBM, Microsoft, Borland; ODBC driver development across 30+ commercial DBMS platforms.

Additional concurrent roles: Network Operations (Interpath Communications), Application Programming (NCSU), Teaching Assistant and Library Systems Consultant (NCSU 1990–1992).

Full details for all positions available at: mccgarrah.org/resume

Skills & Proficiency

Programming Languages

General: Python (1.5, 2.7, 3.x) • Java • C/C++ (Windows/UNIX) • SQL (ISO/IEC portable) • Scala • TypeScript/JavaScript • Shell Scripting (Bash, Zsh, Bourne) • C# • Perl (4/5.005/5.6/5.8/6) • Smalltalk • PHP • Ruby • Base SAS 9 • Groovy • R • MATLAB • Octave • Erlang • Go • Julia • Kotlin • Prolog • Visual Basic • Pascal • FORTRAN • PowerBuilder • Lisp • Scheme • COBOL

IaC: Terraform • OpenTofu • CloudFormation • Ansible • Chef • Puppet • pyFabric

Platforms & DevOps

OS Platforms: Linux (Ubuntu, Debian, Red Hat, Amazon, Arch, Gentoo) • UNIX (Sun Solaris, AIX, HP-UX, FreeBSD, OpenBSD, NetBSD, Ultrix, SunOS) • Mac OS X (System 6.x – X) • Microsoft Windows (NT 3.1 - current) • VMware ESXi • Proxmox VE

Cloud Platforms:

Amazon Web Services (AWS): S3 • EKS (Kubernetes) • Athena • QuickSight • Hadoop on EC2 • EMR • EMR on EKS (vEMR) • CloudFormation • SageMaker • Bedrock • Bedrock Data Automation • MWA (Airflow) • Lambda • Step Functions • EventBridge • CloudFront • IAM • with Kubernetes (EKS, KEDA, Karpenter, Calico, Istio, Cilium, ArgoCD, etc...)

Google Cloud Platform (GCP): Kubernetes • BigQuery • App Engine • Apigee • Google Compute Engine (GCE)

Microsoft Azure: Mirrored services from AWS and varied integration for SSO and key management services

Misc: Rackspace • IBM Cloud • Alibaba • Salesforce • Oracle Cloud (OCI) • DigitalOcean • Heroku • Koyeb • including on-premises hybrid solutions and colocation

CI/CD & Automation & Collaboration: ArgoCD • GitLab CI/CD Pipelines • Jenkins • CruiseControl • CruiseControl.Net • Git • Gitlab Pipelines • GitHub & GitHub Actions • Gitea • Helm • Docker & Rancher • Terraform • OpenTofu • Ansible • Ansible Tower • Maven • Ant • Makefile • Maven • SVN & CVS & RCS • Perforce • PVCS • SourceSafe • MOVEit Automation • Jira • Redmine • Asana • Bugzilla • CircleCI • Travis CI • Confluence

Serverless: Lambda • Step Function • EventBridge • API Gateway • Athena • CloudFront • CloudWatch • DynamoDB • SQS • Aurora Serverless

Databases

Relational Databases: PostgreSQL • MySQL • Microsoft SQL Server • Oracle • Sybase • IBM DB/2 • UniData • SQLite • HyperSQL • Informix • Ingres • Teradata

Non-Relational Datastores: MongoDB • Cassandra • DynamoDB • Redis • CouchDB • HBase • Neo4j • InfluxDB • CockroachDB

Data Management

Data Science Libraries: Pandas • Polars • Matplotlib • Seaborn • Spark • Scikit-learn • NumPy • PyTorch • SciPy • Keras • TensorFlow • NLTK • OpenCV • XGBoost

Data Analytics Tools: Jupyter • Zeppelin (for Hadoop) • Dataliku • Snowflake • Hadoop • TensorFlow • Airflow • Alteryx • Tableau • PowerBI • Qlik • Qlik Open Lakehouse • FiveTran • DataHub • Splunk • ELK Stack • New Relic • Nagios

Data Science Domains: Machine Learning • Deep Learning • Natural Language Processing (NLP) • Computer Vision • Speech Recognition

Software Development

Development Practices: Agile • Software Development Lifecycle • Full Stack Development • APIs (REST, WebSocket, gRPC, SOAP) • Microservices Architecture • Test-Driven Development (TDD) • Object-Oriented Programming (OOP) • Data Structures & Algorithms • HCI • UI/UX

Web Development: Django • Flask • React • Angular • Vue • Bootstrap • Tailwind • jQuery • HTML5 • CSS3 • SASS/SCSS • LESS • FastAPI • Ruby on Rails • Groovy on Grails • Gradio • Apache • Nginx • Caddy • Varnish • Tomcat • Traefik • HAProxy

Security & Compliance: OWASP Top 10 • NIST • HIPAA • GDPR • PCI DSS • ISO 27001 • SOC 2 • FedRAMP • FISMA • FERPA • GLBA • Cloud Controls Matrix (CCM) • NSA ESF • ITIL

This brief resume omits: Certifications, Projects, Publications, OSS Contributions, experience subsection narratives, and early career details.

Full interactive resume at: <https://mcgarrah.org/resume/>

Definitive source: mcgarrah.org/resume/print/

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