

Colby Dolly, Ph.D.

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Professional Summary

Accomplished AI and analytics research leader, quantitative methodologist, and Principal Investigator with over a decade of experience driving enterprise-wide technology adoption, advanced analytics, and empirical research across research institutes, healthcare, and public sectors. Proven track record leading the institutional deployment of large language models (LLMs) and generative AI, establishing enterprise AI governance policies, architecting custom Retrieval-Augmented Generation (RAG) knowledge systems, and designing evaluation frameworks for real-world model performance and data quality. Deep expertise in experimental design (Randomized Controlled Trials, quasi-experiments, causal inference), empirical data validation, and directing multidisciplinary teams of doctoral-level researchers and data scientists. Skilled at translating cutting-edge AI capabilities and complex data into high-impact operational workflows, predictive systems, and automated agentic pipelines while maintaining rigorous standards for data integrity, privacy, and ethics. Holds a Ph.D. in Political Science with extensive quantitative methodology training, certified Prosci® Change Practitioner credentials, and hands-on technical expertise in Python, R, and modern AI developer toolchains.

Education

Ph.D. Political Science (Quantitative Methodology & Institutional Theory) | University of Missouri–St. Louis | 2022

M.B.A. | Lindenwood University | 2006

Certified Change Practitioner | Prosci® | 2021

Professional Experience

Director of Science and Innovation | National Policing Institute | Arlington, VA

January 2023 – Present

- **Enterprise AI Adoption & Governance:** Championed and led enterprise-wide adoption of Anthropic models (Claude) across the institute; co-authored organizational AI acceptable use and governance policies establishing compliance frameworks, privacy standards, and ethical guardrails for generative AI deployment.
- **AI-Powered Advisory Services:** Spearheaded the inception and launch of a new “Advisory Services” practice at NPI, leveraging AI-enabled research and analytical workflows to deliver high-impact consulting, technical advisory, and organizational assessments.
- **Organizational Enablement & Upskilling:** Spearheaded change management by hosting recurring open forums, interactive workshops, and prompt engineering training to accelerate user adoption, technical literacy, and AI competency across research and administrative teams.
- **RAG Architecture & Knowledge Systems:** Architected and deployed an internal Retrieval-Augmented Generation (RAG) vector database indexing historical proposals, past performance data, and staff CVs/subject-matter expertise to streamline organizational knowledge retrieval and accelerate proposal authoring.
- **Agentic Workflows & Automation:** Developed custom organizational AI skills and automated pipelines using Claude Code and Python, reducing statement of work (SOW) and proposal creation turnaround time by 80% while improving proposal consistency and technical quality.
- **AI Research Principal Investigator:** Functions as Principal Investigator on federally funded research initiatives evaluating and operationalizing artificial intelligence applications, including multi-modal analysis and NLP models for video and text data in public safety.
- **Research Leadership & Briefings:** Leads cross-functional teams of doctoral-level researchers across 10+ concurrent projects; delivers executive briefings and analytical reports to senior leadership and external federal stakeholders, translating complex data into strategic recommendations.
- **Strategic Technology Partnerships:** Negotiated and secured the organization’s first commercial technology licensing agreements and AI partnerships to expand data analytics, consulting abilities, and software infrastructure.

Associate Director of Org. Assessments | National Policing Institute | Arlington, VA

August 2022 – January 2023

- Designed and executed complex, data-driven empirical research assessments analyzing organizational structures, workload distribution, resource allocation, and operational efficiency across public institutions.
- Developed and authored comprehensive federal, state, and local grant proposals and competitive RFP responses, formulating experimental hypotheses, sampling designs, and rigorous evaluation methodologies.
- Provided expert technical advisory across multi-stakeholder engagements involving data infrastructure modernization, analytics workflows, and organizational transformation.

Senior Manager | Centene Corporation | St. Louis, MO

January 2021 – August 2022

- Led cross-functional analytics and engineering teams implementing enterprise-wide operational improvements and KPI monitoring platforms across multi-million record transactional and healthcare databases.
- Designed and managed robust data pipeline infrastructure supporting real-time executive decision-making, performance tracking, and cost optimization initiatives across diverse business units.
- Established and administered enterprise ServiceNow workflows to govern data engineering pipelines, resolve data quality issues, and ensure system reliability and data integrity.

Manager | St. Louis County Police Department | St. Louis, MO

August 2013 – December 2020

- Founded, built, and managed the organization’s first Crime Analysis Unit, leading a cross-functional team of 10 research analysts delivering business intelligence, predictive modeling, and strategic analytical support.
- Managed strategic procurement, empirical evaluation, and operational deployment of enterprise technology solutions exceeding \$5 million, including predictive analytics platforms, sensor networks, and body-worn camera systems.
- Developed and deployed open data visualization platforms using ArcGIS, improving data transparency, accessibility, and stakeholder engagement through open data initiatives.
- Directed agency-wide policy development and compliance management, authoring organizational data policies and ensuring adherence to state/federal regulatory standards.
- Implemented departmental performance management systems that established unified single sources of truth for operational KPIs and executive decision-making.
- Spearheaded advanced spatial-temporal statistical modeling to optimize field operations and resource deployment.

Adjunct Instructor | Webster University | St. Louis, MO

2017 – 2018

- Taught “GIS in Criminology,” instructing undergraduate and graduate students in spatial analytics, geoprocessing workflows, spatial statistics, and applied geographic data science using ESRI software.

Research & Technical Competencies

Core Domain	Skills & Methodologies
AI Research & LLM Evaluation	Foundation Model Evaluation, Multi-Modal Systems (Vision, Audio, Text), Real-World Benchmarking, Dataset Quality Control & Annotation Protocols, Synthetic Data Workflows, RAG Architecture, Vector Databases (FAISS, Chroma), Agentic Workflows, MCP Tooling, Prompt Engineering
Experimental Design & Methods	Randomized Controlled Trials (RCT), Quasi-Experimental Design, Causal Inference, Survey & Measurement Design, Statistical Power Analysis, Large-Scale Corpus Quality Auditing, Mixed Methods, Focus Groups
Data Governance, Privacy & Ethics	Privacy-Preserving AI, Secure Data Exchange, AI Acceptable Use & Governance Policies, Bias & Safety Audits, Compliance Frameworks, Change Management (Prosci® Certified), Enterprise Upskilling
Data Science & Statistical Modeling	Natural Language Processing (NLP), Computer Vision Evaluation, Predictive Modeling, Multivariate Regression, Logistic Regression, ANOVA, Factor Analysis, Causal Modeling
Programming & Infrastructure	Python (Pandas, NumPy, Scikit-learn, FastAPI, PyTorch/Transformers ecosystem), R (Tidyverse, Shiny, ggplot2), SQL, LaTeX, Markdown, Git/GitHub, Bash, REST APIs, ServiceNow, Qualtrics, ArcGIS Pro

Publications & Research Output

Peer-Reviewed Research & Funded Project Reports

- Dolly, C., Weisburd, D., Valdovinos Olson, M., & Dong, B. (2026). *Improving police encounters in pedestrian stops: The Phoenix quasi-experiment* (Final report, Award No. 2019-R2-CX-0025). National Policing Institute.
- Dolly, C., Hansen, E., Gallardo, R., Coleman, J., Wender, J., Lande, B., Ta-Johnson, V., Tomlinson, M., Ben-Yosef, G., & Tu, P. (2024). *Multi-modal analysis of body-worn camera recordings: Evaluating novel methods for measuring police implementation of procedural justice* (Final project report No. 2020-R2-CX-0010). National Policing Institute. [Multi-modal computer vision and NLP model evaluation on real-world video datasets].
- Dolly, C., Cherkauskas, J., Hansen, E., & Renouard, E. (2024). *Considerations for Specialized Units: A Guide for State and Local Law Enforcement Agencies to Ensure Appropriateness, Effectiveness, and Accountability*. Washington, DC: Office of Community Oriented Policing Services.
- Dolly, C. (2023). *Assessment of Washington's Byrne JAG-Supported Multi-jurisdictional Task Force Program*. National Policing Institute, Arlington, VA.
- Dolly, C. (2022). *Determinants of police department change: An institutional theory approach* (Doctoral dissertation). University of Missouri–St. Louis. <https://irl.umsf.edu/dissertation/1145>
- Dolly, C., & Shawver, B. (2018). The organizational and practical considerations of starting a crime analysis unit: A case study of a Midwestern police department. *Policing: A Journal of Policy and Practice*, 12(3), 255–264. <https://doi.org/10.1093/police/pay005>

Technical, Client & Technology Evaluation Reports

- Fisher, R., Dolly, C., Johnson, C., & Motz, R. (2024). *A Multi-site Evaluation of the Use and Impact of Automated License Plate Readers* [Unpublished client research evaluation for a large technology company].
- Fisher, R., Dolly, C., & Isaza, G. (2024). *An Assessment, Evaluation, and Analyses of Use of Force*. Prince William County Police Department (VA). National Policing Institute, Arlington, VA.
- Dolly, C., Fisher, R., & Johnson, C. (2024). *Organizational Assessment* [Unpublished client research report for a large midwestern agency]. National Policing Institute, Arlington, VA.
- Dolly, C. (2024). *Update to Staffing Study*. Ferguson Police Department (MO). National Policing Institute, Arlington, VA.
- Dolly, C., & Hansen, E. (2024). *University Public Safety Staffing Study* [Unpublished client research report for a large private university]. National Policing Institute, Arlington, VA.
- Dolly, C., & Johnson, C. (2023). *Organizational Workload and Staffing Assessment*. Brooklyn Center Police Department (MN).

Funded Research & Grant Procurement

- **Intelligent Risk Management system (IRM) for 911 Calls** | Bureau of Justice Assistance (BJA). Total Award: \$690,400. Role: Co-Author. Funded Period: 2024–2027.
- **Evaluation of Training using Body-Worn Cameras** | Bureau of Justice Assistance (BJA). Total Award: \$950,000. Role: Co-Author. Funded Period: 2024–2027.
- **Use of Force Evaluation** | Prince William County, Virginia. Total Award: \$250,000. Role: Author and Principal Investigator. Funded Period: 2023–2024.
- **National Evaluation of Police Supervision** | National Institute of Justice (NIJ). Total Award: \$1,000,000. Role: Co-Author. (Awarded).
- **Multi-Jurisdictional Task Force Evaluation** | Washington State Department of Commerce. Total Award: \$195,000. Role: Author and Principal Investigator. Funded Period: 2022–2023.
- **Gun Violence Reduction Program** | Bureau of Justice Assistance (TIPS). Total Award: \$400,000. Role: Author and Program Manager. Funded Period: 2016–2019.
- **Peer Support Program** | Office of Community Oriented Policing Services (COPS). Total Award: \$70,000. Role: Co-Author. Funded Period: 2020.

Presentations & Invited Talks

- “Improving Police Encounters in Pedestrian Stops Using Procedural Justice”
2026 Conference on Evidence-Based Solutions in a Global Policing World, University of Cambridge, UK
- “National Policing Institute and Zencity Launch Inaugural Nationwide Public Safety Confidence Index”
2025 International Association of Chiefs of Police (IACP) Annual Conference, Denver, CO
[Interactive Dashboard Link](#)
- “Multi-modal Analysis of Body-Worn Camera Recordings: Evaluating Novel Methods for Measuring Police Implementation of Procedural Justice”
2025 American Society of Evidence-Based Policing Conference, Tucson, AZ
- “Strengthening Internal Accountability Through Data Analytics”
2024 Public Safety Partnership Conference, Minneapolis, MN
- “Examining Officer Use of Force in a Large County Police Department”
2024 American Society of Criminology Annual Meeting, San Francisco, CA
- “Specialized Units: How They Can Help and How They Can Hurt”
2024 IACP Conference, Boston, MA
- “Smart Cities Technology Panel”
2024 U.S. Government Accountability Office (GAO), Washington, DC
- “Automating Data Analysis and Reporting with R”
2017 International Association of Crime Analysts Annual Conference, New Orleans, LA
- “The Bureaucratic Challenges of Civil Unrest: Managing Crisis in Ferguson, Missouri”
2015 Midwest Public Affairs Conference, Milwaukee, WI

Awards & Professional Honors

LEADS Scholar | National Institute of Justice (NIJ) | 2020

Competitively selected for national fellowship program recognizing emerging leaders in evidence-based research, law enforcement data science, and technology evaluation.