Nelson A. Colón Vargas, *Ph.D.*

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USA

Spotify Verified Artist: *Nel Abdiel* ✔

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EXPERIENCE

U.S. Food & Drug Administration - *Office of the Commissioner*, DC.

Artificial Intelligence Lead - Responsible AI Official   Jun 2023–Present

As the highest-ranking AI Official at the FDA, I serve as a strategic advisor to the C-Suite, providing leadership and guidance on the responsible and effective use of Artificial Intelligence (AI), including Large Language Models (LLM), Natural Language Processing (NLP), and Machine Learning (ML). This includes policy input to the Department of Health and Human Services.

- *Responsible AI Leadership*: Actively promote and implement responsible AI practices, with a particular focus on generative AI, including Large Language Models (LLM). Leading the development of the agency's policy on the usage of Generative AI, the AI Playbook, and AI Strategy, emphasizing the ethical and responsible AI principles on the Blueprint for an AI Bill of Rights.

- *AI Governance and Advisory*: Establish the AI Governance and Advisory Board, which continuously oversees the agency's AI policy and position.

- *Team Leadership*: Successfully lead and grow a dynamic AI team, instrumental in advancing the agency's strategic vision for AI. Initiating projects that utilize AI/ML/LLM/NLP/RPA technologies to address high-value enterprise needs while ensuring alignment with responsible AI principles, as well as the agency's privacy and confidentiality guidelines.

- *Interagency Collaboration*: Serve as the AI & Data Subject Matter Expert for an Interagency Collaboratory initiative between the Defense Health Agency, Health and Human Services, and the Department of Veterans Affairs. Provide guidance on AI technologies, especially concerning sensitive data and critical decision-making when integrating data across multiple agencies, prioritizing data privacy, security, and ethical standards to preserve interagency collaboration integrity and safeguard sensitive information.

- *National Impact*: Serve as an AI Subject Matter Expert for the White House Cancer Moonshot initiative, contributing to ongoing national efforts in the healthcare sector.

- *Boards and Committees*: Chair the FDA's AI Governance and Advisory Board, providing critical leadership in shaping the agency's AI strategy. Member of various national committees, including the Machine Learning and AI Subcommittee at the White House National Science and Technology Council, the AI Subcommittee of the FDA Digital Health Advisory Board, and the AI R&D Working Group at the White House.

U.S. Digital Service, *Executive Office of the President*, The White House

AI & Cybersecurity Lead   Nov 2021–Jun 2023

Office of the CTO at the Department of Veterans Affairs:

- Provided technical guidance on Generative AI, emphasizing ethical and responsible AI practices and its implementation.

- Collaborated on Discovery Sprints and technical planning for Data Science projects, ensuring alignment with the White House principles of responsible AI.

- Served as a Subject Matter Expert on the ethical and responsible implementation of AI/ML for the Veterans Benefits Administration, addressing fairness and transparency concerns.

Defense Digital Service, *Department of Defense*, The Pentagon, DC.
Details of projects and performance limited due to the sensitive nature of the work in regard to national security.

- Cultivated partnerships both internally and externally with organizations in the Department of Defense and Intelligence Community to promote responsible AI practices and facilitate collaboration.

- Represented DDS and the CDAO on expert panels and actively contributed to discussions on Responsible AI and AI Ethics within the Department of Defense.

- Established the Data Science Community of Practice across the Office of the Chief Digital & AI Officer, further fostering responsible AI awareness and practices.

- Managed the capacity planning of the Data Science and Data Engineering teams.

- Provided technical leadership on the development of an AI-driven Insider Threat Detection platform for the Defense Counterintelligence and Security Agency (DCSA).

- Collaborated with the National Cyber Investigative Joint Task Force (FBI - NCIJTF) in the development of an AI-driven continuous monitoring tool that detects code leakage.

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EXPERIENCE

White House Presidential Innovation Fellows, Washington, DC.
Principal AI Lead - *Entrepreneur in Residence*   Jan 2019–Oct 2021
  Claims Attributes API

- Spearheaded the development and deployment of the Claims Attributes API, revolutionizing the VA's benefit claims process.

- Significantly reduced Veteran's decision wait time by 7-11 days, resulting in improved access to benefits.

- Achieved a remarkable 27-fold decrease in manual claim establishment, leading to operational efficiency.

- Generated annual recurrent savings of 10 million for the Department of Veterans Affairs through innovative AI solutions.

- Successfully built and led a high-performing interdisciplinary team of 25 professionals, including designers, developers, data engineers, business analysts, and cloud architects.

- Presented progress and performance updates to key stakeholders, including VA CTO, VA CIO, and executives from the Department of Veterans Affairs, General Services Administration, and the White House.

- Identified and pursued opportunities for expanding the Benefit Product Portfolio, enhancing the organization's strategic growth.

  Redesign of Fraud Waste & Abuse Operations

- Led the transformation of Fraud Waste & Abuse operations, shifting from postmortem investigations to real-time detection.

- Strengthened data architecture and initiated a seamless cloud migration.

- Forged partnerships with private sector vendors and security groups, enhancing data accuracy and reducing detection time.

  Additional Duties

- Collaborated with USDS, Department of Labor, NSF, and Department of Transportation on AI-related initiatives, demonstrating expertise and leadership.

- Drafted comprehensive AI and Cybersecurity Strategy and Policy for the Intelligent Transportation Systems Joint Program Office at the Department of Transportation.

- Integral in establishing the AI Community of Practice at the Technology Transformation Services, General Services Administration, unifying over 500 members from various government agencies.

- Played a pivotal role as a Subject Matter Expert in AI and Cybersecurity in response to critical incidents like Solarwinds.

Microsoft, Redmond, WA / Humacao, P.R.
Data & Applied Scientist II - Intellectual Property Protection & Solutions   Feb 2018–Jan 2019

- Developed algorithms to detect Microsoft product keys suspicious activations based on time and geospatial data using techniques like Topological Data Analysis, Time Series Anomaly Detection with Python packages likePandas, NumPy and SciKit-Learn among other libraries.

- Built and maintained Machine Learning models to detect and prevent malicious and scripted registrations and intrusions, with False Positive and False Negative rates of less than 2.5%, reducing manual revision by 87%.

- Led bi-weekly collaborative discussions with Forensic Investigators and Risk Managers to analyze emerging attack vectors.

Soteria - Tailored Cybersecurity Solutions, Charleston, S.C.
Lead Data Scientist   Jun 2016–Jan 2018

Led a cross-functional team consisting of Data Engineers, Software Engineers, and Security Analysts to revamp Soteria's DNSense product, transitioning it from a rule-based prototype to an automated Machine Learning solution for detecting and reporting suspicious domain registrations. Spearheaded the ideation, development, and deployment of Soteria's proprietary NLP/NLU phishing detection solution.

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ACADEMIC AFFILIATIONS

Columbia University - *School of International and Public Affairs*
Adjunct Faculty - *Lecturer*   Sep 2022–Present
  Computing in Context (INAFU 6006) - *Graduate Course*

> Teaching a class of 60 graduate policy students, every Fall semester, the practical tools and techniques of Data Analytics and Data Science, and the Ethics and Responsibilities that come from developing products for Social Good. In charge of curriculum development, lab creation and the supervision of 5 Graduate Teaching Assistants.

EDUCATION

University of Iowa, Iowa City, IA
Ph.D., Mathematics
M.Sc., Mathematics

University of Cambridge, Cambridge, UK
M.St., AI Ethics and Society - *In Progress*

University of Puerto Rico, Rio Piedras, San Juan, PR
B.Sc., Mathematics

CERTIFICATES & PROGRAMS

Partnership For Public Service, Washington, D.C.
Artificial Intelligence Federal Leadership Program

Aspen Technology Policy Hub, Washington, D.C.
Writing and Communicating for Policy
Policy Impact

The Data Incubator, Washington, D.C.
Data Science Certificate

Berklee College of Music, Boston, MA
Songwriting Professional Certificate

TALKS/PANELS & AWARDS

Artificial Intelligence for Regulatory Review - FDA	Oct 2023
Leveraging AI Responsibly - Ponce Health Science University	Oct 2023
The AI Landscape at FDA (Keynote) - FDA's 11th Scientific Computing Days	Sep 2023
Truths and Myths about AI - Asociación de Periodistas de Puerto Rico	Aug 2023
Embracing Artificial Intelligence - Ciencia Boricua (Radio Interview)	Jul 2023
AI, Civic Tech, and Public Policy - SIPA — Columbia University	Jul 2023
Ethical Uses of AI in the Federal Government - ATARC	Aug 2022
Can AI Help Increase Fairness and Equity? - AI & Data Roundtable, ATARC	Jun 2022
Predictions from the Pros: The Future of AI - Digital Transformation Submit, ACT-AIC	Mar 2021
STEM and Race: Can We talk? - University of Iowa	Mar 2021
AI to Accelerate Claim Processing - ASAM Roundtable, Partnership For Public Service	Jun 2020
Special Act Award - Technology Transformation Services, General Services Administration	

PUBLICATIONS

The Localized Skein Algebra is Frobenius, Nel Abdiel and Charles Frohman, *Algebraic and Geometric Topology* Volume 17, Issue 6, October 2017.

Frobenius Algebras Derived From The Kauffman Bracket Skein Algebras, Nel Abdiel and Charles Frohman, *Journal of Knot Theory and its Ramification*, Volume 25, Issue 04, April 2016.