Finance Researcher Develops Explainable AI Systems to Strengthen U.S. Anti-Money-Laundering Compliance

Georgia State University researcher Pristly T. Mazumder develops AI tools that make financial crime detection faster, fairer, and more transparent.

ATLANTA, GA, UNITED STATES, October 28, 2025 /EINPresswire.com/ -- Finance researcher and compliance technologist Pristly Turjo Mazumder has announced a new wave of research and innovation integrating Artificial Intelligence (AI) and Financial Crime Compliance to help U.S. financial institutions detect and prevent money-laundering activities with greater speed, accuracy, and transparency. His mission is to align technological progress with the United States' national priority of protecting the integrity of its financial system.

> Explainable AI bridges innovation and trust. My goal is to make financial compliance faster, fairer, and more transparent for U.S. financial institutions."
>
> *Pristly Turjo Mazumder*

Mazumder's research focuses on Explainable Artificial Intelligence (XAI), a branch of AI that improves the interpretability of machine-learning models used in Anti-Money-Laundering (AML) and Trade-Based Money-Laundering (TBML) detection. By creating models that clearly communicate the "why" behind every risk alert, his work empowers financial investigators and regulators to make faster, fairer, and more defensible compliance decisions.

His recent studies, published through Springer Nature's Digital Finance and IEEE Access, demonstrate how XAI and graph-based learning can reveal hidden financial relationships while meeting the auditability standards required by U.S. regulatory agencies. By combining SHAP-based model interpretation, conformal prediction, and risk-utility optimization, Mazumder's framework reduces false positives, prioritizes the most valuable alerts, and helps institutions allocate investigative resources more efficiently.

Mazumder's flagship project, "Leveraging Explainable AI for Enhanced Transparency in Financial Crime Detection Systems," proposes an interpretable model architecture that bridges the gap between AI research and real-world compliance operations. The framework introduces confidence scoring and utility-driven triage that align with the U.S. Treasury's 2024 National

Strategy for Combating Illicit Finance. By ensuring that every decision made by an AI system can be explained in human terms, Mazumder's approach enhances both accountability and regulatory trust.

Before pursuing graduate research, Mazumder spent more than seven years working in Trade Finance, Corporate Banking, Cash Management Operations, and Financial Crime Compliance across global financial institutions. His professional journey includes managing documentary credits, conducting due-diligence investigations, and supporting compliance officers in assessing cross-border transaction risks. This hands-on experience gives him a rare dual perspective: understanding both the operational pain points of banking teams and the technical capabilities of modern data science.

ristly Turjo Mazumder – Researcher in Explainable AI and Financial Crime Compliance

"Financial crime compliance is entering a transformative era," said Mazumder. "AI can no longer be a black box. My goal is to make advanced analytics interpretable and actionable, not just for data scientists, but for compliance analysts, auditors, and regulators who depend on transparency to make sound decisions."

Beyond academic research, Mazumder collaborates with technology-driven financial startups and U.S. universities to develop open-source, privacy-preserving AML testing environments using synthetic datasets. These environments enable innovators to explore advanced models safely without exposing confidential customer data. He also contributes to public discussions on responsible AI, fintech regulation, and digital-asset compliance, advocating for trustworthy technology that supports both innovation and consumer protection.

Through his work at Georgia State University's Robinson College of Business, Mazumder continues to explore how AI, blockchain, and ISO 20022-standardized payment data can be combined to improve AML monitoring in cross-border trade and correspondent banking. His vision is to make every suspicious-activity review both explainable and economically optimized, producing higher-quality Suspicious Activity Reports (SARs) per hour of investigator effort while reducing operational burden.

Mazumder's research directly supports U.S. policy priorities outlined by the Department of Treasury, the Financial Crimes Enforcement Network (FinCEN), and the Office of Foreign Assets

Control (OFAC), agencies emphasizing modernization of AML systems to safeguard the U.S. financial network from illicit actors. By improving transparency and fairness in machine-learning decisions, his work addresses critical gaps in algorithmic accountability and reinforces public trust in digital finance.

As Mazumder builds his career in the United States, his broader mission is to foster collaboration between academia, banks, and technology firms to strengthen the country's capacity to detect financial crimes in an era of rapid digital transformation. His combination of industry expertise and research innovation represents a national-interest contribution toward making the U.S. financial ecosystem more resilient, transparent, and globally competitive.

Pristly Turjo Mazumder
Georgia State University
+1 470-530-6686
pmazumder1@student.gsu.edu
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