



# Detecting Crime in the Banks

Johannes Pippidis Lorentzen

## Problem

How should one build AML/CFT systems, incorporating machine learning, artificial intelligence, graphs, and other analytical techniques, to best detect and prevent money laundering and terrorist financing?



### Detection

*What detection capabilities are truly needed?*

This part explores what it means to detect financial crime in practice: from the nature of criminal behavior to how it becomes visible in data.

It examines which analytical capabilities are actually required to identify money laundering and terrorist financing, and why detection so often fails despite advanced systems.

By connecting criminological insight with data observability, the goal is to define what should be detected, where it can be found, and how it can be meaningfully represented.



### System

*How should AML/CFT systems be built?*

This part examines how detection systems can be designed to balance analytical depth, interpretability, and operational efficiency.

It focuses on how data, models, and human expertise should interact, and on the trade-offs between automation, precision, and coverage.

The aim is to outline a system architecture that enables measurable, explainable, and auditable detection performance.



### Governance

*How should the governance of detection systems be structured?*

This part looks at how organizational structures, compliance frameworks, and incentives shape the effectiveness of detection systems.

It studies how audits, documentation, and regulatory requirements can support transparency without creating barriers to improvement.

The goal is to define governance principles that ensure accountability, traceability, and continuous learning across technical and institutional boundaries.

AML: Anti-Money Laundering  
CFT: Combating the Financing of Terrorism

#### Article 1:

##### Irregular Deposits in Norway: Systemic Economic Crime in the Rental Market

- 24.5–42.6 % of rental deposits are *irregular*, breaching the Norwegian Tenancy Act.
- 85 % of repayments lack interest payments → tenants lose accrued income.
- Indicates a **systemic enforcement gap** and a pattern of low deterrence for noncompliance.

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#### Article 2:

##### Understanding Case Management Systems in Criminal Investigations

- CMS form the core workspace for handling investigative data.
- Current systems lack tools for discovery, hypothesis testing, and retrieval.
- Study defines a six-step investigative workflow with a two-tier model.
- Thirteen functional needs identified, including entity linking and contradiction checks.

Co-authors: Mads Skipanes (1), Sule Yildirim Yayilgan (2)

2<sup>nd</sup> Review

#### Article 3:

##### From Manual Annotations to ML-Ready Datasets

- Builds a full NER + Entity Resolution pipeline for real criminal investigation data.
- Compares automatically extracted entities with those manually created by detectives.
- Demonstrates how investigator annotations can be transformed into machine-learning-ready datasets.
- Uses approx. 4 000 documents and 15 000 labels from two real homicide cases
- Provides the first framework to benchmark automatic NER against investigator practice in police investigations.

(To be submitted before the conference) Co-authors: Mads Skipanes (2)

Submitted\*

#### How Banks Obstruct Effective AML Audits

- Examines how banks hinder AML audits without breaching rules.
- Identifies structural and linguistic obstruction like documentation overload and controlled communication.
- Builds a typology of techniques and suggests reforms for audit transparency.

#### Efficiency of AML Detection Systems

- Studies how AML systems are measured and why evaluations fail.
- Explores how measurement itself shapes system behavior.
- Proposes a framework for assessing real detection performance.

#### MLML – Money Laundering Modelling Language

- Creates a structured modelling language for money trail obfuscation cases.
- Inspired by DBML, combining syntax and visualization.
- Enables modelling of flows, transformations, and entities.

#### Data Fragmentation in AML Systems

- Shows how super-merchants and intermediaries erode observability.
- Links fragmented data to weaker detection and higher false positives.
- Proposes metrics for measuring data visibility loss.

#### Axiomatic Criminology – Toward a Foundational Theory of Crime

- Proposes a unified theoretical framework for criminology based on three axioms:
  - Crime is statistically deterministic,
  - Individual criminality is not deterministic,
  - Crime is an emergent property of society.
- Bridges deterministic macro-patterns with unpredictable individual behavior.
- Positions existing criminological theories as approximations within a larger unified model.
- Lays the groundwork for agent-based modeling and policy design based on systemic rather than individual factors.

There are more ongoing projects — feel free to ask me about them!

**PhD Candidate:** Johannes Pippidis Lorentzen – [johanlor@stud.ntnu.no](mailto:johanlor@stud.ntnu.no)  
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**Supervisors:** Prof. Sokratis K. Katsikas, Prof. Slobodan Petrovic, Roy Oma (DNB Bank ASA)  
**Affiliation:** NTNU – Department of Information Security and Communication Technology (IIK), CISaR Group