



Neural Nexus Team Maps Out The Future Of Healthcare Fraud Detection

The Neural Nexus Team present their approach to tackling the major issue of Healthcare Fraud. The team consists of Nithin Mohan, Dovile Janauskaite, Anna Coyle, Dave Mulry and David Mullins.



The AtlanTec AI Challenge 2025, powered by Liberty IT takes place on Friday, 16th May at the University of Galway. The event promises to be a great success with.....

HEALTHCARE TODAY

€1.34 BILLION LOST BY HSE!!!

Over 5% of the annual healthcare budgets in Europe is lost to Fraud.

The HSE budget for 2025 is €26.9 billion – and if current European trends continue, over €1.34 billion of that could be lost to fraud.

"Intentionally, knowingly and wilfully carrying out, or attempting to carry out a scheme to defraud any healthcare benefit program"

- ❖ Billing for services not performed
- ❖ Billing for a more costly service than what was performed
- ❖ Forging or altering bills or receipts



Exposing the Blind Spots: Why Healthcare Fraud Slips Through the Cracks

The healthcare system is **particularly vulnerable** to fraud because of the multidimensional set of **payers, providers & patients**

Because the payer of health care is often different from the recipient, there is **no natural check**

The payer has **limited methods to verify** that the service was provided

The patient has **limited ways to know** if the provider has **billed the payer correctly**

Two doctors arrested over suspected fraud against HSE

Gardai probe allegations of false treatment claims as two medical professionals face questioning over suspected misused of public health funds.

Gardaí investigating a suspected fraud against the Health Service Executive (HSE) and exchequer have arrested two doctors for questioning.

The Irish Times understands the doctors face allegations they made claims for payment from the HSE in respect of patients that were not treated or were treated for more minor matters than was stated.



Pharmacy Group Overcharging

HSE claims up to €7 Million lost due to rule breaches from 2011-2016; case prompts wider investigation into pharmacy sector practices

The HSE had alleged it was owed between €5 million and €7 million from a prominent pharmacy group for non-compliance with dispensing rules between June 2011 and August 2016.

The case involving the HSE and a limited company, which operates the pharmacy group, was heard before Mr Justice Michael Quinn for 11 days until a settlement was announced on Friday.

In 2016, the HSE was paid €12 million by another group, the biggest pharmacy chain in Ireland, in settlement of a separate dispute with that company over phased dispensing. It then widened its investigation into other operators within the pharmacy sector.

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HEALTHCARE FRAUD UNDER SCRUTINY

16-05-2025

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DETECTING FRAUD, SAVING COSTS

Can we help to reduce healthcare costs by efficiently detecting higher propensity for potential fraud from the perspectives of provider and patients?

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Detecting Fraud Using Graph Analysis & AI

New system uses anomaly detection and network graphs to flag suspicious provider-patient behavior in insurance claims.

Neural Nexus team processed healthcare claims to engineer behavioral features, applied anomaly detection to flag outliers, and used graph analysis to reveal suspicious provider-patient networks. This is an end-to-end system for surfacing potential fraud.



Provider,
Patient and
Claims Data*



Feature
Engineering



Anomaly
Detection



Network
Graph



Fraud Flags

*Synthetic Data was used in this case

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Impactful Results from Analysis

System detects high-value fraud patterns and anomaly clusters, urging continuous updates and human oversight for accuracy.



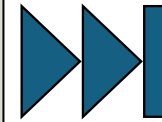
High-value & frequent claims flagged



Clusters of linked suspicious activity



Anomalies identified during normal processing



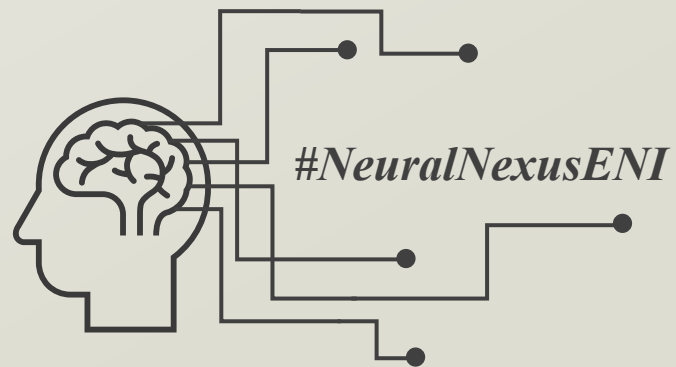
NEXT STEPS

Test using real datasets

Fine tune feature sets

Developing real-time analytics

THANK YOU





Áras na Ríomheolaíochta
Computer Science Building

EVERNORTH
HEALTH SERVICES

#ATLANTEC

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David Martin