

## Machine Learning 2018: Predictive big data analytics and healthcare fraud: From detection to prevention-Eman Abu Khousa- UAE University

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The losses from healthcare fraud, over-prescribing and improperly coded insurance claims leading to claim-denials are estimated in the billions of dollars annually. The costs related to fraud and acts of abuse are increasing insurance premiums for patients and cuts into the profitability of healthcare service providers and payers. The continuing adoption of Electronic Health Records (EHRs) and the advances of machine learning and big data analytics enable more efficient and automated methods for detecting and effectively mitigating the risk of fraudulent activities and illegitimate claims. This paper provides an overview of the new systems and methods to reduce medical claims fraud and a review of open issues and challenges. This paper also proposes a predictive analytics approach to detect potential fraudulent patterns using a set of supervised and unsupervised learning techniques. The proposed approach incorporates both historical and real-time data to identify illegal claims and prevent payouts to fraudsters early in the claims management process lifecycle.

Predictive analytics identifies patterns that are potentially fraudulent then develops sets of "rules" to "flag" certain claims. For example, a provider making a claim for a procedure that's outside of his/her area of experience would be flagged for further scrutiny, because that's one among the "rules".

But built into this healthcare fraud detection software model is AI, which can continually mine data, identify more and more emerging fraudulent patterns and make new "rules" for those also. The "intelligence" within the system learns from these new rules and continually becomes more

sophisticated in identifying, even more, fraud potentials. And the best models not only flag the potentials but provide the explanations for that flagging, in order that investigations and assessments by management are often completed efficiently.

In short, a solid healthcare fraud auditing and detection system will provide protection to the payer within the following ways:

- Identify inconsistencies and "rule-breaking" behaviors.
- Detect and prevent potentially improper payments, by flagging them for review.
- Continually mine data to identify new fraudulent patterns and develop new "rules" for those as well.

The beauty is within the big data which will all be mined and analyzed by one software tool, instead of a number of separate healthcare fraud detection systems that do not function in coordination, or worse, don't even "know" to see other Internet data sources. One of the foremost common sorts of fraud, for instance, is that the continued claims for a private who has died. An antiquated system won't have this information, but a system that's "plugged into" big data will. This term is the overarching one that is used for all varieties of analytical methods for collecting and analyzing big data to craft a statistical model of behaviors in the future. Analysts will make predictions and then train the model to recognize and engage in monitoring behaviors as claims come in. There is both prepayment modeling, with a focus on such things as office visits and

transactions, and post-payment modeling which analyzes both provider and patient behaviors.

**Biography :**

Eman Abu Khoua is a Researcher-Instructor (Big Data Applications) at the College of Information Technology, UAE. Najati is an experienced health information technology (IT) professional with 25-year experience in the field. Najati is an expert in advising GCC clients on strategies for selections & implementations of health IT with focus on achieving demonstrable clinical, operational and financial benefits. Najati is well versed in the revenue cycle-management (RCM) field with knowledge of the various nuances and requirements of GCC countries. Najati's other areas of expertise include smart use of health IT for enhanced patient experience, EDI, data analytics and applications of Artificial Intelligence/Machine Learning (AI/ML) in healthcare. Najati has coauthored three articles for conferences and journals – one having received a best-paper award. Najati's work experience spans top USA medical centers to world class suppliers of health IT.

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