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Using Data Science Helps Optimize Patient Administration

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Commentary

Data-driven management is becoming increasingly popular in a variety of industries. Meaningful use of electronic health data is gradually becoming an important management tool. Data science has recently introduced new techniques for extracting usable information from large amounts of data. However, the application of data science to healthcare administration is still being researched. The Editor's Choice papers this month highlight the use of data science in a variety of healthcare operations, including radiation therapy dose tracking, disease surveillance using EMR query, and patient flow prediction.

"An automated dose tracking system for adaptive radiation therapy," the first Editor's Choice paper, proposes an efficient and convenient dose tracking system for Adaptive Radiation Therapy (ART). The two main processes in tracking radiation dose during ART are daily dose computation and dose accumulation. Influenza epidemics are a serious public health risk that necessitates a time-consuming and costly surveillance system. "Leveraging hospital big data to track flu epidemics," the second Editor's Choice article, says. To collect weekly influenza-like sickness activity, a data query method was developed to get important data from electronic health records. This method exemplifies how an EMR may be used to create near-real-time estimations from hospital big data. By giving extra characteristics on the population in question or by releasing information sooner, such an approach could serve as a supplement to regular monitoring methods.

At current healthcare management, overcrowding in the hospital's Accident and Emergency Department (A&ED) is a major issue. A method to explore an integrated framework with high accuracy for predicting A&ED patient flow under different triage levels, by combining a novel feature selection process with deep neural networks, is described in the third Editor's Choice article, "A universal deep learning approach for modelling the flow of patients under different severities." The findings showed that the proposed integrated "DNN-I-GA" framework is effective. As a result, A&ED management can use this system's prediction of patient demand to plan and allocate resources. Clinical evaluations and neuropsychological testing (including IQ, attention, and memory tests) as well as general health and behaviour surveys were used to investigate neurodevelopment. Electrocardiography and echocardiography were used in the cardiac examination. Between-group differences were investigated using univariate analyses of covariance. Chemotherapy-exposed children were compared to controls, and anthracycline-exposed children were compared to controls. In addition, the incidence of behaviour issues in children whose moms died and those with surviving mothers was compared to matched controls [1-5].

Imaging mathematics is a fast evolving subject of study that is evolving in lockstep with the discipline of imaging. Imaging is a subfield of biomedical engineering that considers new approaches to visualise biological tissues with the goal of improving health. "Medical imaging research improves diagnostic tools in clinical settings and supports the development of drugs and other therapies," per the National Institutes of Health. The technological components of medical imaging include tool for collecting and diagnostic interpretation with the least amount of error. When depicting the inside parts of a patient's body, image clarity and resolution are extremely significant. Despite the availability of various user-friendly resources for image processing features such as enhancement, colour alteration, and compression, new processing methods are still worthy of development. With the use of practical examples, we hope to present the role of fractional calculus in imaging in this article.

A fresh perspective on using data science to aid healthcare administration. The new techniques involve combining data flow from various technologies for dose tracking, retrieving data from hospital big data, and using deep learning to forecast A&E overcrowding. More research ideas involving the use of data science to improve healthcare, we hope, will be offered.

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