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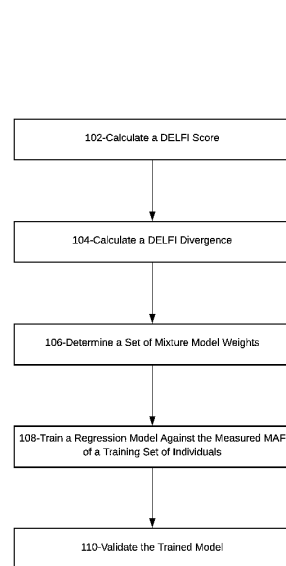


FIGURE 1

(57) Abstract: The present disclosure provides methods and systems that utilize analysis of cell-free DNA (cfDNA) fragmentation profiles in a sample obtained from a patient, determining a ratio of short to long fragments and a fragment size distribution from the fragmentation profile and determining a divergence score based on the ratio of short to long fragments in the sample as correlated to a ratio from a sample from a healthy patient, and determining, by the machine learning model, a monitoring score for the sample based on the fragmentation score, the divergence score, and the model weights, the monitoring score being indicative of a level of a tumor-derived nucleic acid in the cfDNA of the sample to detect, monitor, diagnose, predict cancer status, determine the likelihood of the presence of cancer and administer treatment to the patient.

[Continued on next page]

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