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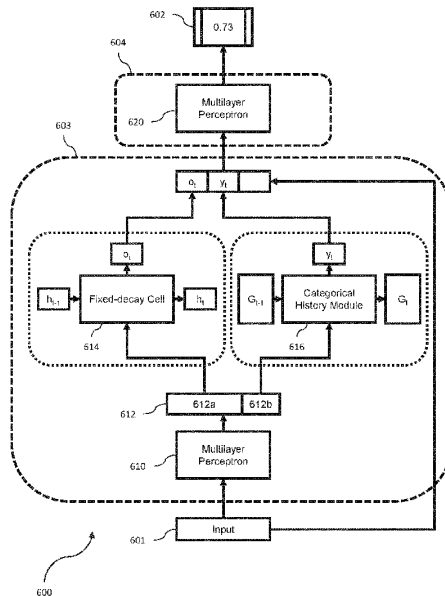


FIG. 6

(57) Abstract: A machine learning system for processing data corresponding to an incoming transaction. The machine learning system comprises a categorical history module which includes a memory configured to store state data for a plurality of categories indexed by a respective category identifier, wherein the state data stored in the memory for each category identifier corresponds to a previous transaction associated with the entity and the respective category. A decay logic stage is configured to modify state data stored in the memory based on a time difference between a time of the incoming transaction and a time of a previous transaction. When the memory contains state data for the entity and category identifier pair associated with the incoming transaction, a decaying function dependent on the time difference is applied to the stored state data to generate a decayed version. The state data output from the decay logic stage is updated using an input tensor generated from the data corresponding to the incoming transaction to generate updated state data.

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