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(54) **Title:** SYSTEMS AND METHODS FOR PARTICLE CLASSIFICATION USING MACHINE LEARNING

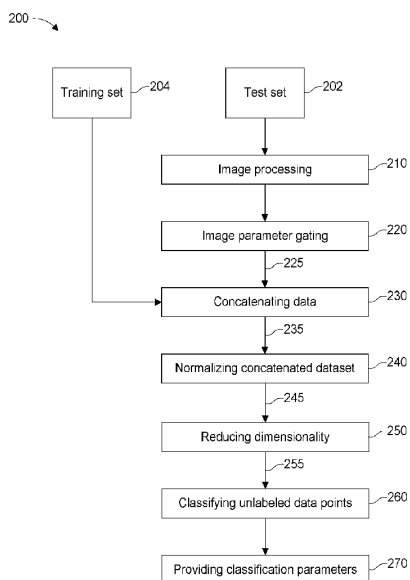


FIG. 2A

(57) **Abstract:** Disclosed herein are machine learning-based particle classification systems, as well as related methods, computing devices, and computer-readable media. For example, in some embodiments, a particle classification system may include: an electronic processing device configured to: receive, from an imaging flow cytometer instrument, a test set comprising unlabeled data to classify; pool the test set and a training set into a concatenated dataset comprising a plurality of parameters, wherein the training set comprises labeled data; normalize the concatenated dataset by bringing the variance to one for each of the plurality of parameters; non-linearly reduce a dimensionality of the normalized concatenated dataset to a reduced dimension space; compute classification parameters by classifying the unlabeled data from the reduced dimension space using the labeled data from the reduced dimension space; and provide the classification parameters for further processing.

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