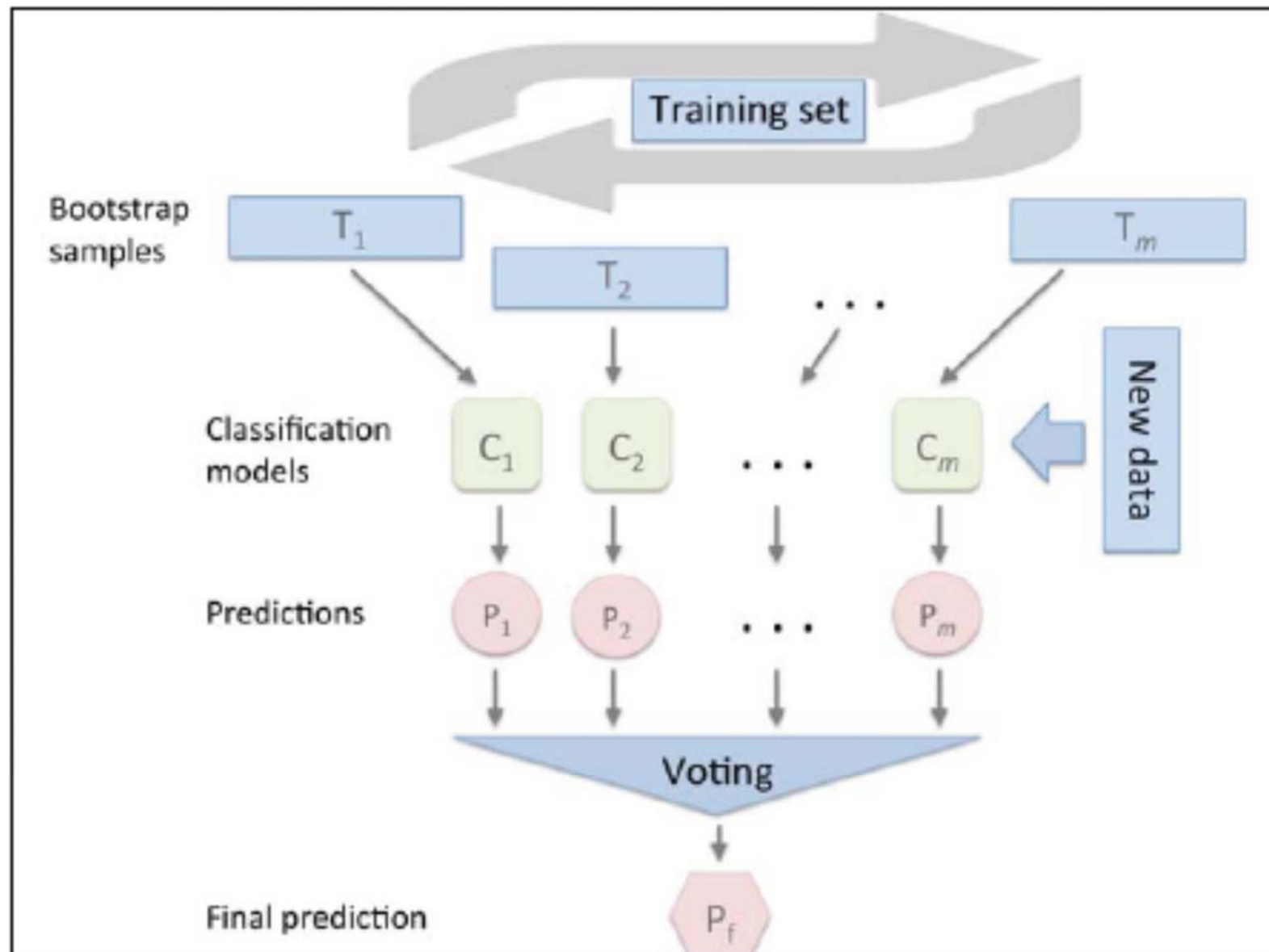


# Bagging – building an ensemble of classifiers from bootstrap samples

(*schema*)

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# Bagging: Bootstrap Aggregation

- Leo Breiman (1994)
- Take repeated **bootstrap samples** from training set  $D$ .
- *Bootstrap sampling*: Given set  $D$  containing  $N$  training examples, create  $D'$  by drawing  $N$  examples at random **with replacement** from  $D$ .
- Bagging:
  - Create  $k$  bootstrap samples  $D_1 \dots D_k$ .
  - Train distinct classifier on each  $D_i$ .
  - Classify new instance by majority vote / average.