Recommended Models

### **2. River: Adaptive Models**

[River](https://riverml.xyz/) is the best library for real-time online ML — especially in resource-sensitive environments like Kubernetes.

#### Suitable Models from River:

|  |  |  |
| --- | --- | --- |
| **Model** | **Purpose** | **Why it's great** |
| HoeffdingTreeRegressor | Adaptive trees | Captures nonlinear trends incrementally |
| AdaptiveRandomForestRegressor | Powerful ensemble | Great for mixed trends or variable load |
| ARIMA (time series) | Forecasting usage | For periodic trends (day/night patterns) |

Recommended as next-generation backend for TrendLearner

**2. HistGradientBoostingRegressor (offline batch)**

Use when:

* We’re okay with batch retraining (e.g., daily)
* We need nonlinear modeling
* Online updates are not critical per second

Good for offline retraining; not ideal for real-time Kubernetes scenarios.

**3. Vowpal Wabbit (VW)**

**Use when:**

* You have very high throughput (millions of requests per second)
* Need CLI-based stream ingestion or online logistic regression

Requires more setup, not Python-native, but extremely fast