

# Online Learning Systems (Online Learning Systems)

## Real-time Adaptation

- Update model immediately upon data arrival
- Utilize Stochastic Gradient Descent (SGD)
- Low Latency
- Streaming data processing

## Online Pipeline

- Data Ingestion: Real-time data collection
- Feature Extraction: 즉시 특성 추출
- Model Update: Progressive weight update
- Deployment: Hot-swapping model deployment

## Update Strategy

- Per-sample Update: Update per sample
- Mini-batch Update: Small batch update
- Adaptive Learning Rate: Dynamic learning rate adjustment

- Forgetting Factor: Decrease weight of old data