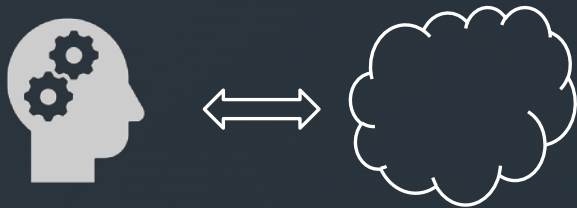


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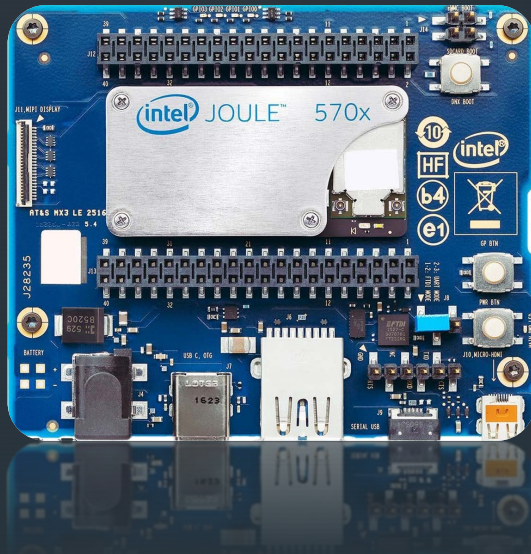
# Programming IoT Edge Devices: Cloud-Client Duality

## The Advent Of Intelligent IoT Devices



- Demand:
  - Unacceptable latency of the cloud
  - Privacy and security concerns
  - Cost, infrastructure limitations
- Supply:
  - Moore's Law
  - The need to innovate

## Edge Device: Definition



- IoT Edge Device
  - Increased compute capacity
  - Handles disconnected scenarios
  - vs. sensor or actuator

## Workloads of the Future



- Today:
  - Data filtering, aggregation
- Tomorrow:
  - AI: Machine Learning, Computer Vision

## Build Yourself an Edge Device



- Need software frameworks and tools that:
  - Make developers productive
  - Low overhead
  - Power efficient
  - Cloud-client interop: training in the cloud, inference on the edge



## Cloud First Approach



- IoT Edge Device = Cloud Device
- “Bring cloud to the device”
- Examples:
  - AWS Greengrass, Azure IoT Edge
- Minimize transit latency
- Handle disconnected scenario
- Reduce development costs



## Client First Approach



- IoT Edge Device = Small Factor Computer
- Why not “wrap the cloud”?
  - How ML is done today
  - Performance overhead
  - Power needs



## Quo Vadis?



- Opponents or partners?
- One will win?
  - Could be some other one!
- Both will exist, target different audience