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Cloud-based real time face detection and recognition Basic model:

Cloud Human Face Image Pre-**Human Face** Processing Detection Return processing Recognition (Map-Reduce (via Viola-(WIFI, Blue predict result (via K-NN, via Spark, Jones or to client tooth, internet) PCA, LDA) Hadoop) CNN)

Analogy: Suppose we need to finish 400m, if we had 4 "Usain Bolt", can we get optimal?

9.58s + 9.58s + 9.58s + 9.58s = 38.32s

How about men's  $4 \times 100$  m relay?

The world record: 36.84s (the Jamaican team at the 2012 London Olympic games)

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## Improved model:

Image Preprocessing (WIFI, Blue tooth, network)

Cloud Processing (Map-Reduce via Spark, Hadoop) Human Face
Detection
(via Viola-Jones or CNN)

Human Face Recognition (via K-NN, PCA, LDA)

Return predict result to the client

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- Challenges
  - Volumne of monitor data (images)
  - Limited parallelization for the whole process
  - Huge computation costs
- We hope that:
  - find an efficient way to collect cloud data and send to supercomputer
  - parallel I/O (Comet file system)
  - parallelize the process as much as possible