

Wearable Cognitive Assistance Applications on Cloudlets

Zhuo Chen, Lu Jiang, Wenlu Hu, Kiryong Ha, Brandon Amos, Padmanabhan Pillai[†], Alex Hauptmann, Mahadev Satyanarayanan
Carnegie Mellon University and [†]Intel Labs

Goals

- Provide guidance for everyday tasks on wearable device

Input:
some target task



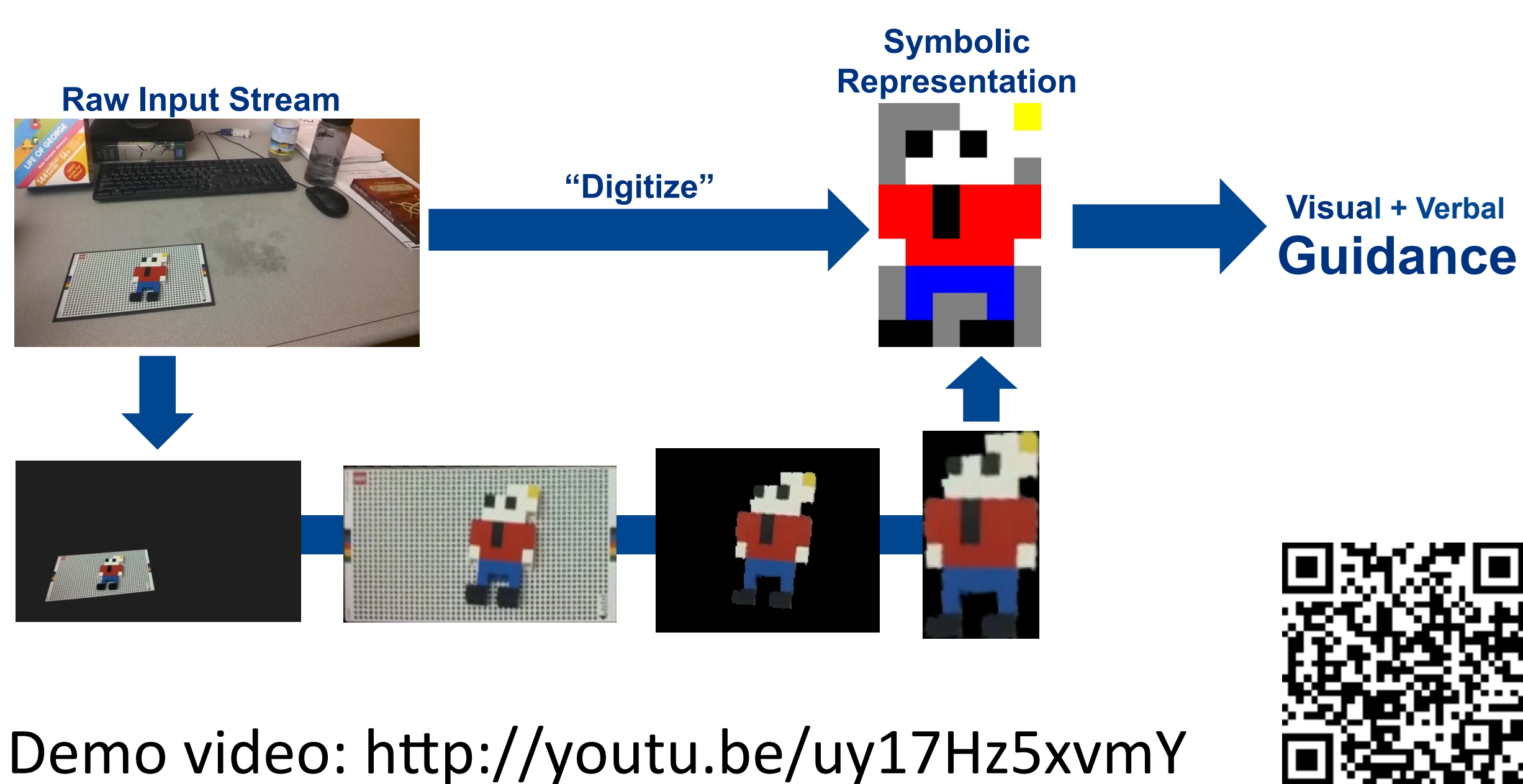
Guidance:

- step by step instructions
- know your progress
- corrective feedback

- Cloudlets can provide low-latency, Cloud-like compute resources to augment the mobile device
- Explore a few well-defined examples of task assistance

Lego Construction Guide

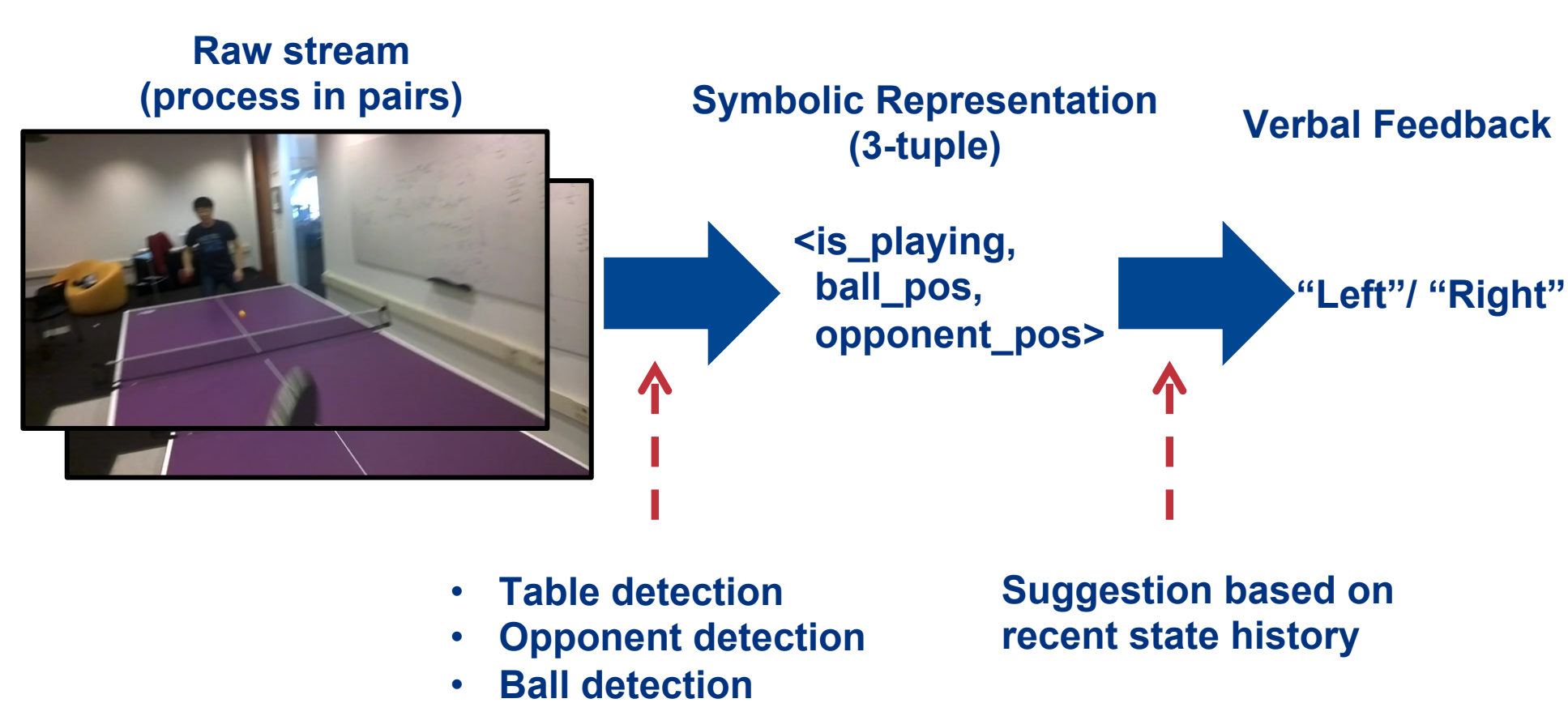
- Assist in constructing 2D Lego models
- Step-by-step instructions based on current state
- Verbal + visual guidance to add, remove, or move a piece



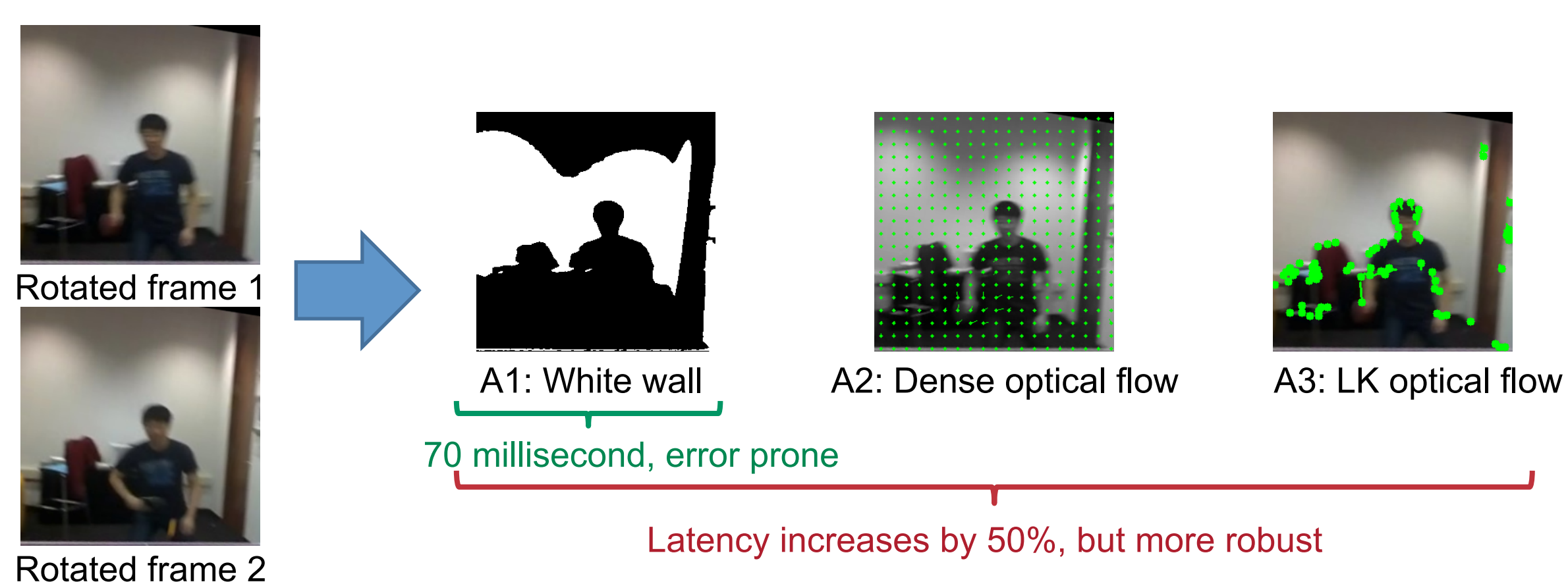
- Demo video: <http://youtu.be/uy17Hz5xvmY>

Ping Pong Coach

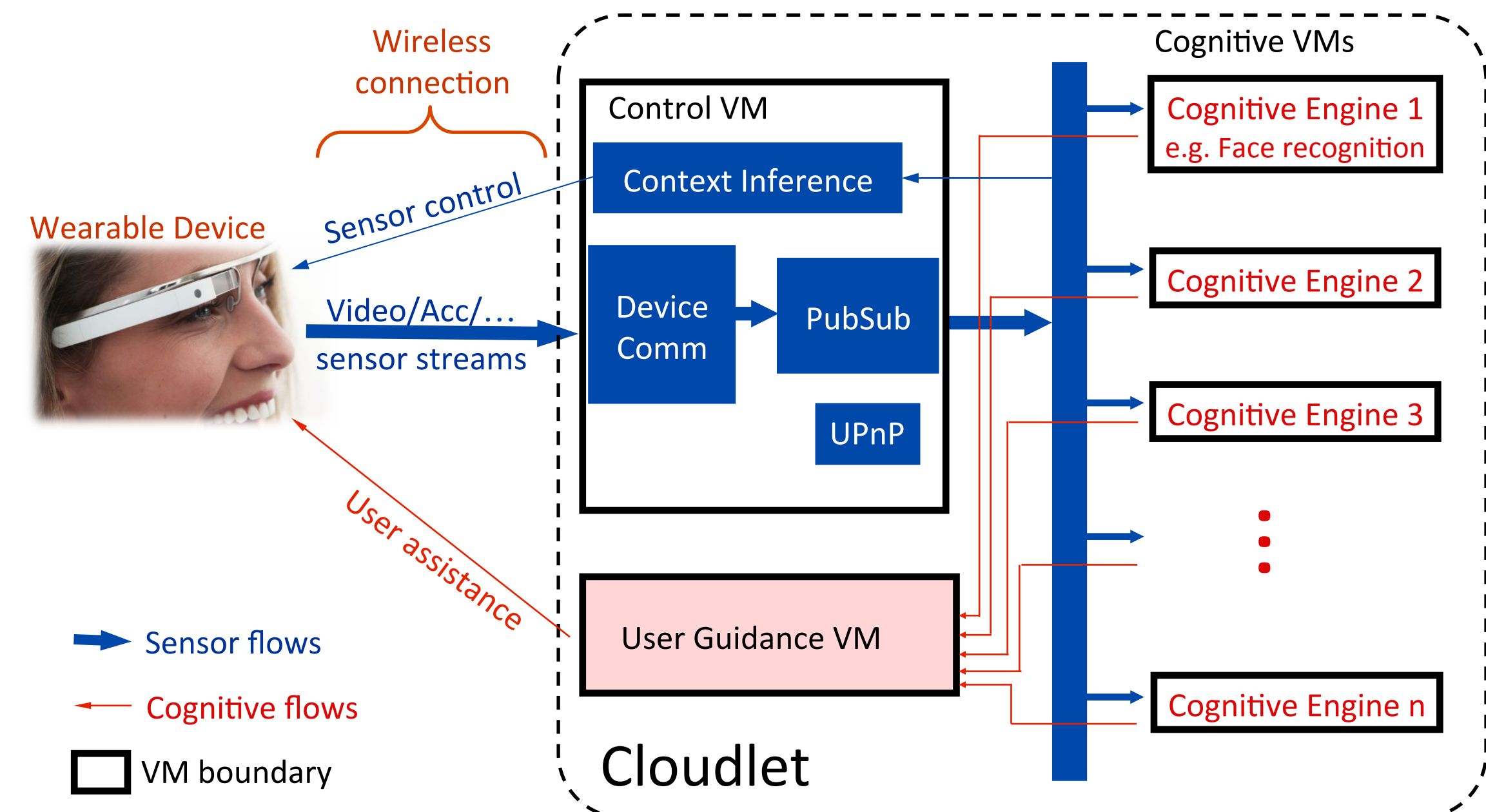
- Suggest hit left or hit right based on opponent, ball positions
- Requires extremely fast response times



- Multiple opponent detection algorithms run in parallel for speed and accuracy

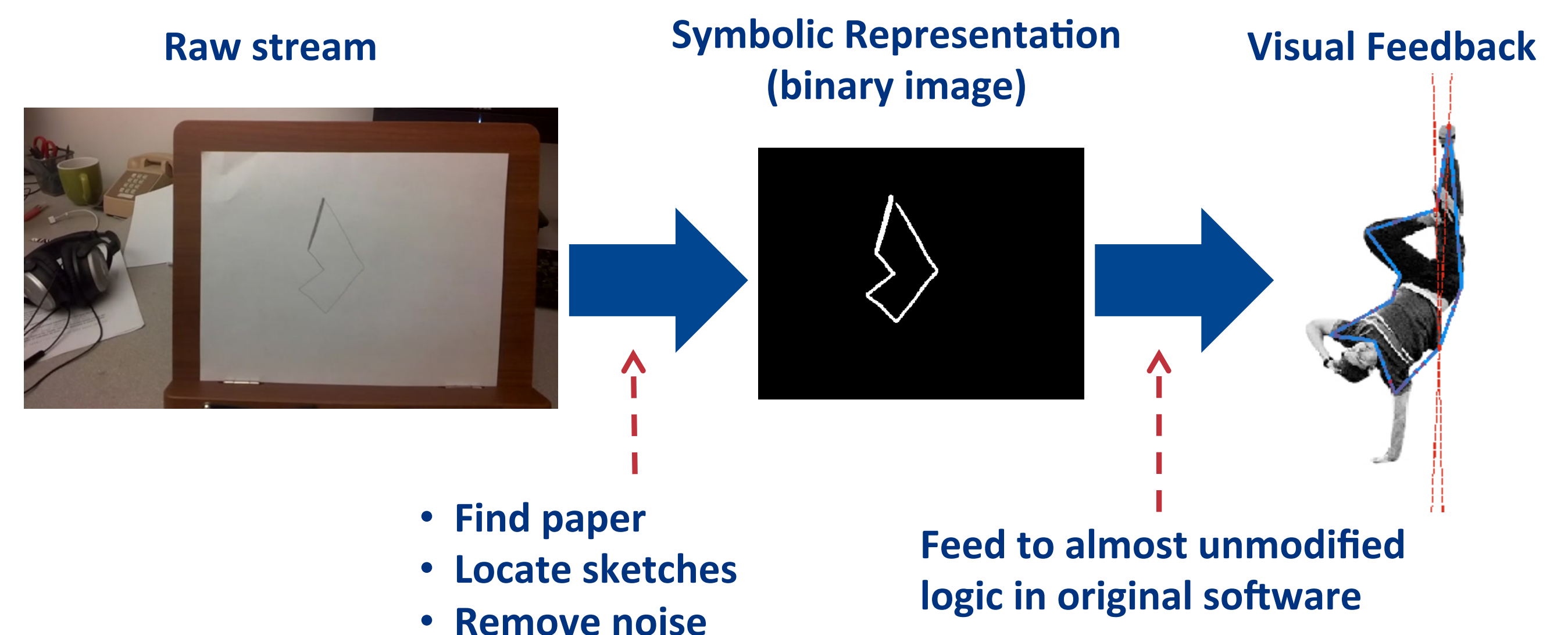
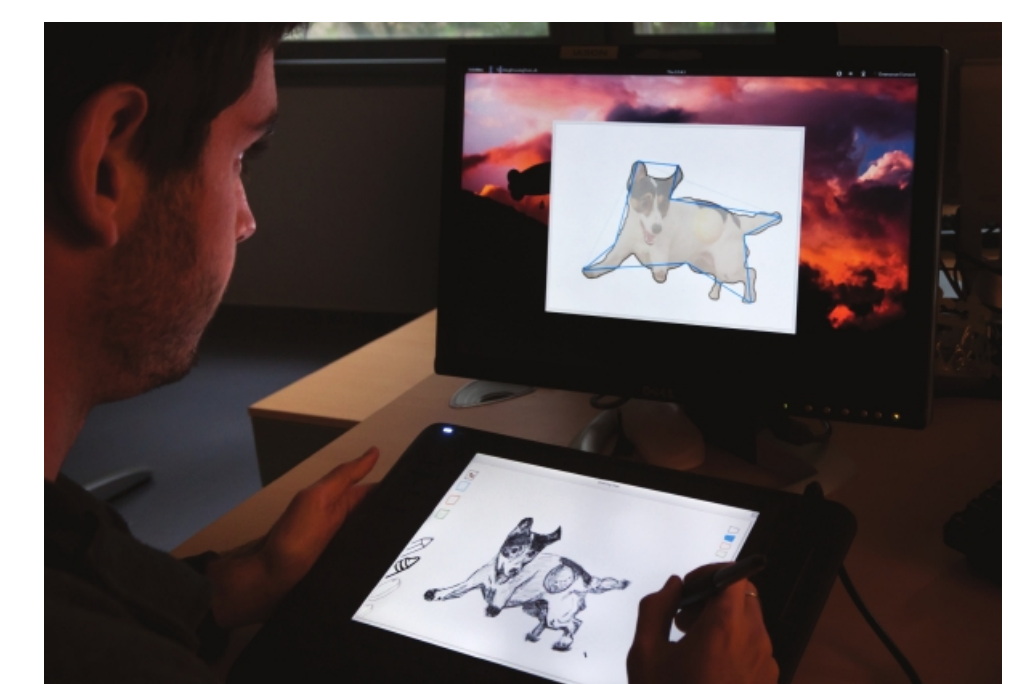


Gabriel: Cognitive Assistance Framework



Drawing Instructor

- Modify existing sketching tutor app
- Replace digitizer input with Glass camera + custom CV code
- Guidance provided in Glass display



- Wearable drawing tutor can work with any physical medium

Context-based YouTube Tutorials

- Deliver context-relevant tutorial videos
 - 87+ million tutorial videos on YouTube
 - State-of-the-art context detector
- E.g. making an omelet
 - Recognize egg, butter, etc.
 - Recommend video for same style omelet, with same tools
- Coarse-grained guidance in form of displayed video

