IC Cam: Mobile IC Package Recognition
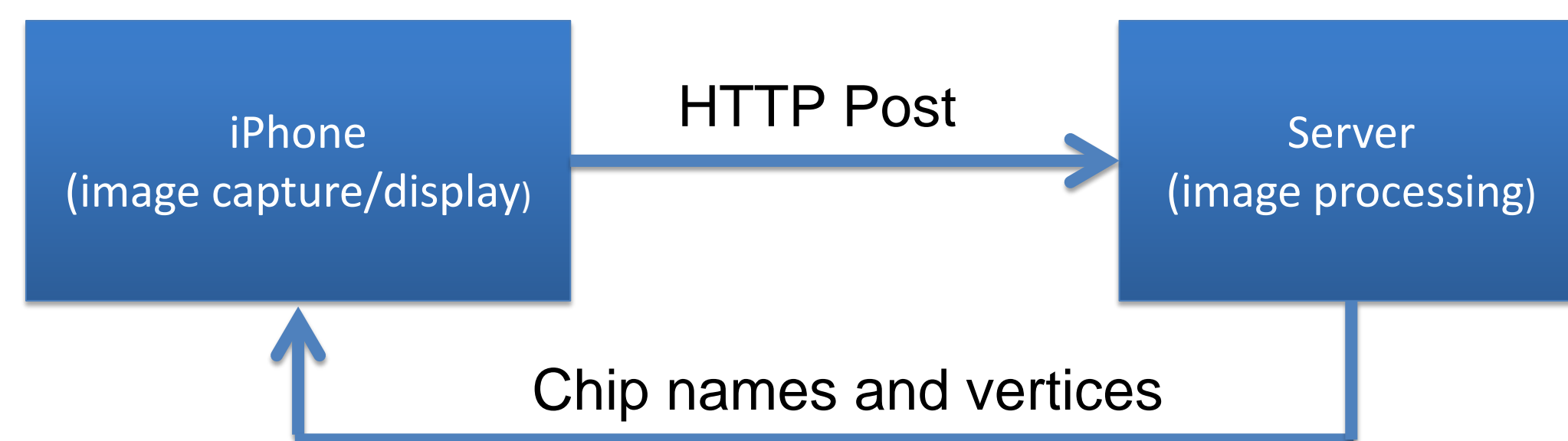
Patrick Blaes, Chris Young
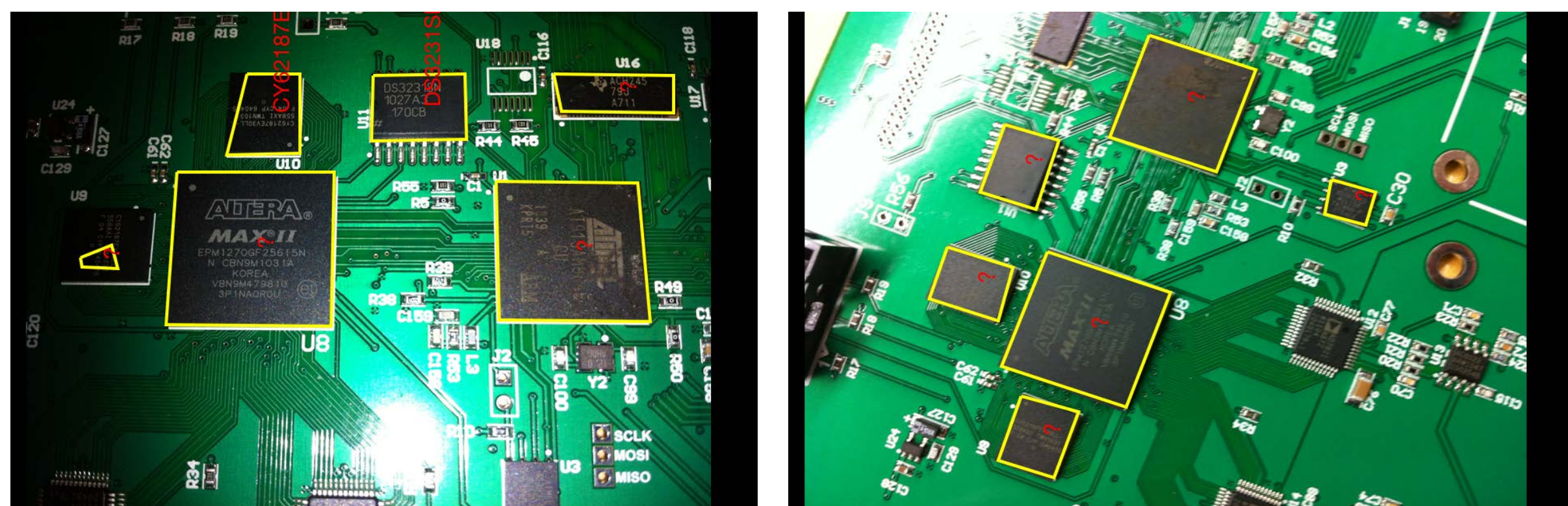### Department of Electrical Engineering, Stanford University

Motivation

Modern printed circuit boards (PCBs) typically contain many integrated circuits (ICs). Identifying and obtaining information about the ICs on a board can be very tedious. Our project, implemented as an iPhone app, aims to automatically locate and identify the ICs given an image of a circuit board.

System Architecture

iPhone (image capture/display) — HTTP Post → Server (image processing)
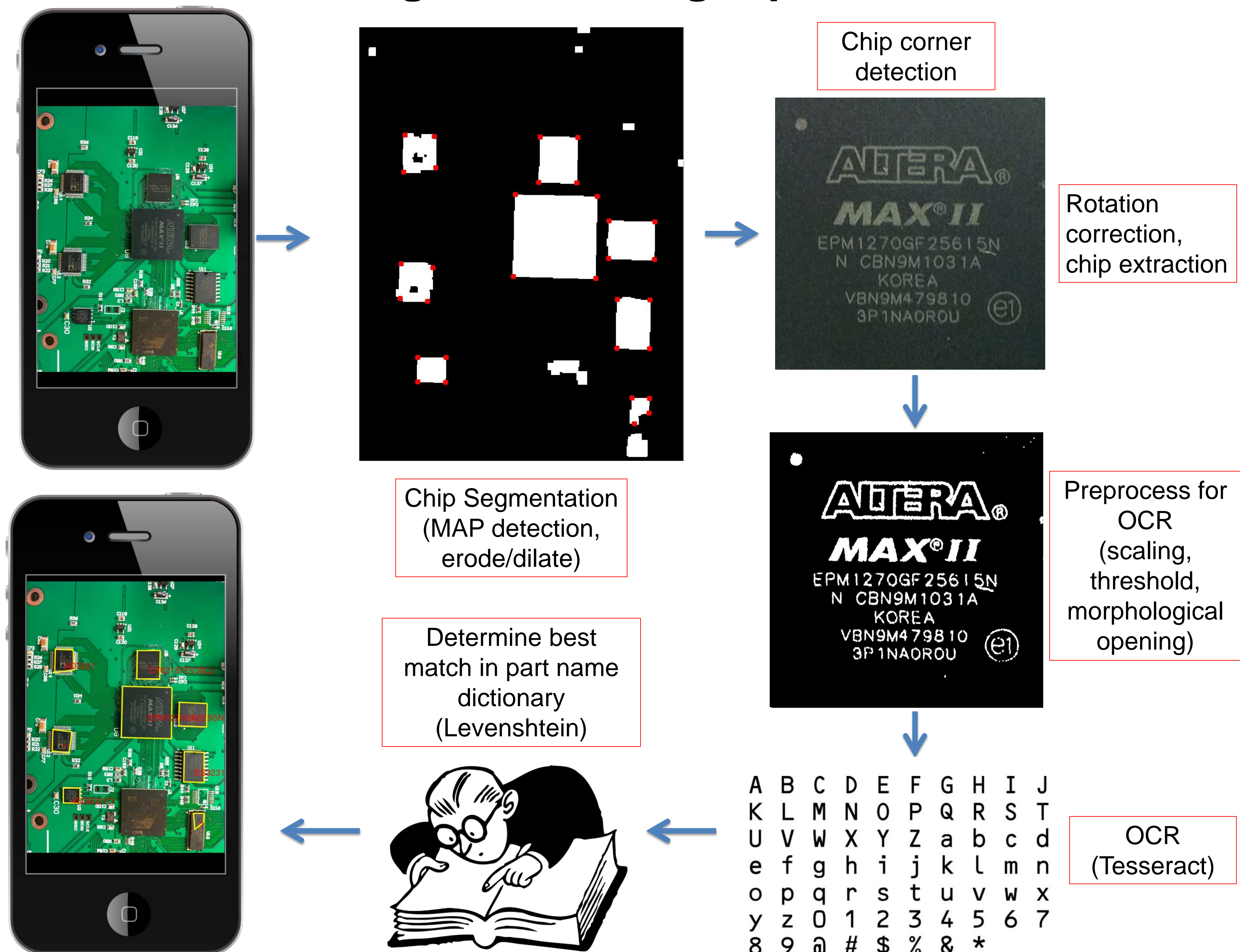
Chip names and vertices

Functionality

- Rotation invariant
- Robust to non-chip objects
- Best with even lighting
- Sensitivity to glare, blur, and sensor noise

Image Processing Pipeline

Chip corner detection

Rotation correction, chip extraction

Chip Segmentation (MAP detection, erode/dilate)

Preprocess for OCR (scaling, threshold, morphological opening)

Determine best match in part name dictionary (Levenshtein)

OCR (Tesseract)

References

- C.R Jung and R Schramm. Rectangle detection based on a windowed Hough transform. In Computer Graphics and Image Processing, 2004. Proceedings. 17th Brazilian Symposium on, pages 113–120, 2004.
- R.C. Gonzalez and R. E. Woods. *Digital Image Processing, Third Edition.* Pearson Education. 2009.
- Google. Tesseract OCR Engine: http://code.google.com/p/tesseract-ocr/