

Retrieval of Lecture Slides by Automatic Slide Matching on an Android Device

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Motivation

- Increased popularity of slides in public presentations (e.g. class lectures, technical conferences)
- Increased popularity of smartphones at these events
- Slides often available in advance
- Currently no way to quickly find the correct slide from a large database (e.g. if an attendee is late)

Automatic Slide Matching Algorithm

Server: Presentation slides stored as individual image files

Prior to application use, extract SIFT features and REVV signatures from database slides

Find the slide in the query image using image segmentation and region labeling

Extract SIFT features

Coarsely rank the database slides using REVV matching

Perform RANSAC matching on top candidates

Send the query image from the Android device to the server

Android device: Presentations stored as PDF files



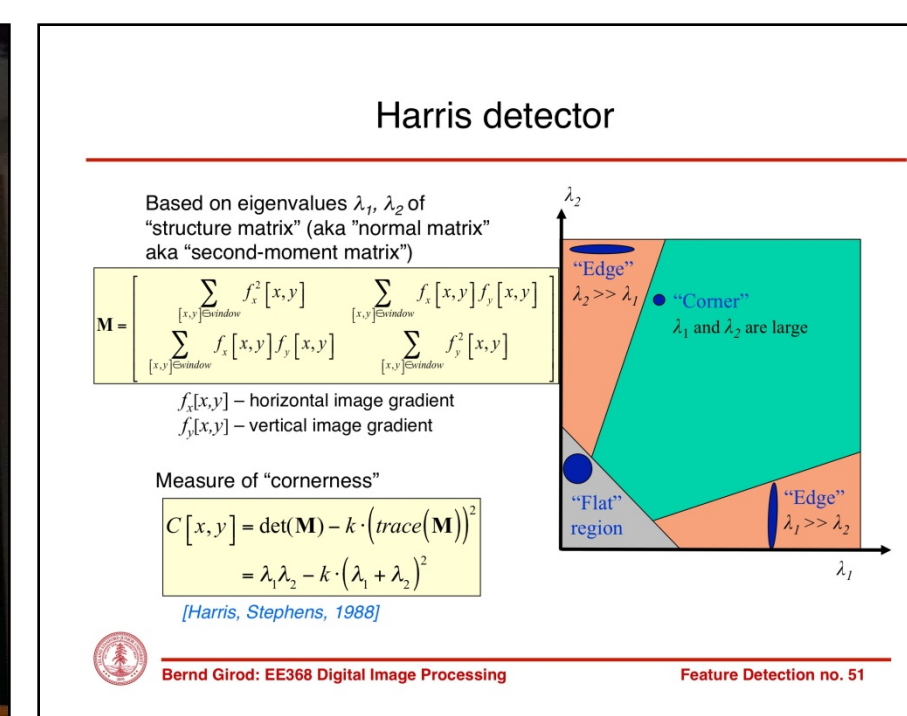
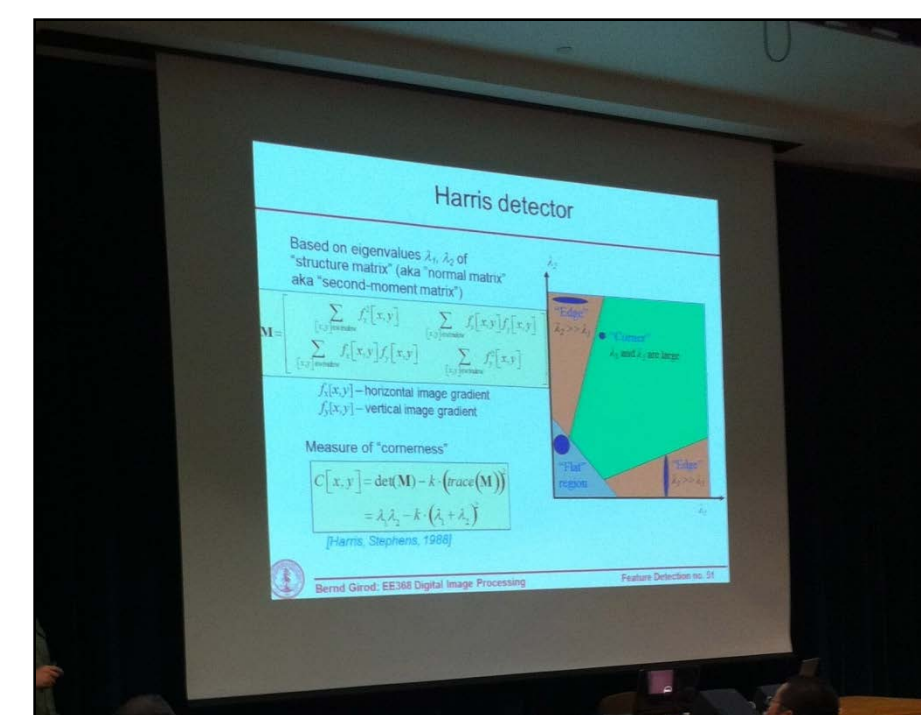
Open the corresponding PDF file and provide user with page number

Related Work

- N. Cheung, D. Chen, V. Chandrasekhar, S. Tsai, G. Takacs, S. Halawa, B. Girod, "Restoration of out-of-focus lecture video by automatic slide matching," in ACM International Conference on Multimedia 2010, Firenze, Italy, 2010.
- Q. Fan, K. Barnard, A. Amir, A. Efrat, M. Lin, "Matching slides to presentation videos using SIFT and scene background matching," in ACM International Workshop on Multimedia Information Retrieval, New York, NY, 2006, pp. 239 - 248.
- S. Tsai, D. Chen, J. Singh, B. Girod, "Rate-efficient, real-time CD cover recognition on a camera-phone," in ACM International Conference on Multimedia 2008, Vancouver, BC, 2008.
- D. Chen, S. Tsai, V. Chandrasekhar, G. Takacs, H. Chen, R. Vedantham, R. Grzeszczuk, B. Girod, "Residual enhanced visual vectors for on-device image matching," in Asilomar Conference on Signals, Systems, and Computers, 2011.

Experimental Results

Correct match: 44 query images were tested over 10 iterations. The correct slides were found 91% of the time.



Incorrect match: Correct slide very similar to matched slide. Not an issue with REVV rankings; mismatch attributed to RANSAC.

