MusicGuide

Album Reviews on the Go
Serdar Sali
Motivation

- Album covers have little info

- So what? Google it with with your phone...
Motivation

- Cramped keys on cell phones

Barcodes?

RFID?
Motivation

- Barcodes difficult to focus on
- RFID not widely available

Why not use cameras as input devices?
MusicGuide

• Take photo of cover & send it to server

User

MusicGuide Server

• Match Image
• Collect Data

Send Data to Phone
Object Recognition

- David Lowe’s Scale Invariant Feature Transform (SIFT)
  - Based on local points of interest determined by Difference of Gaussians
  - 128-dimensional vector as descriptor to characterize the keypoint
SIFT Because...

Illumination Change, Rotation

Blurry/Noisy Images

Clutter, Different Scales

Different viewpoints
Collecting Product Data

- Amazon Web Services API
  - Product Rating, Track Samples
- Metacritic : Parsed HTML
  - Product Rating, Reviews, Links to full reviews
Technical Overview

- Phone interface in Python
- ASP.Net, MySQL, C/C++ on the server
- An HTML file with the results is pushed to the phone
- Data communicated is minimal: ~100Kb in total without track samples
## Results Page – Rating & Samples

**Vespertine**  
**Bjork**  
Amazon Rating: 4.5/5  
Metacritic Rating: 88

- **Read Reviews**  
- **Listen to Samples**  
- **Check Prices**

### Listen to Samples

<table>
<thead>
<tr>
<th>Number</th>
<th>Song Title</th>
<th>Listen</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Hidden Place</td>
<td>Listen</td>
</tr>
<tr>
<td>2.</td>
<td>Cocoon</td>
<td>Listen</td>
</tr>
<tr>
<td>3.</td>
<td>It's Not Up To You</td>
<td>Listen</td>
</tr>
<tr>
<td>4.</td>
<td>Undo</td>
<td>Listen</td>
</tr>
<tr>
<td>5.</td>
<td>Pagan Poetry</td>
<td>Listen</td>
</tr>
<tr>
<td>6.</td>
<td>Frosti</td>
<td>Listen</td>
</tr>
<tr>
<td>7.</td>
<td>Aurora</td>
<td>Listen</td>
</tr>
<tr>
<td>8.</td>
<td>An Echo A Stain</td>
<td>Listen</td>
</tr>
<tr>
<td>9.</td>
<td>Sun In My Mouth</td>
<td>Listen</td>
</tr>
<tr>
<td>10.</td>
<td>Heirloom</td>
<td>Listen</td>
</tr>
<tr>
<td>11.</td>
<td>Harm Of Will</td>
<td>Listen</td>
</tr>
<tr>
<td>12.</td>
<td>Unison</td>
<td>Listen</td>
</tr>
</tbody>
</table>
Results Page - Reviews

- Summary reviews from Metacritic with links to full review

<table>
<thead>
<tr>
<th>Reviews</th>
<th>Score</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nude As The News</td>
<td>95</td>
<td>A beautiful, magical, mystical soundtrack; similar to Homogenic, but in a sense, more light-hearted and full of love.</td>
</tr>
<tr>
<td>Dot Music</td>
<td>90</td>
<td>It's unlikely you'll hear anything as near to perfect, magical and downright lovely all year.</td>
</tr>
<tr>
<td>CDNow</td>
<td>90</td>
<td>With Vespertine, Bjork has constructed a whispering wall of wonders, and instead of forcing everyone out, has invited the world to look through the cracks.</td>
</tr>
</tbody>
</table>
Matching Performance

- 45 Query Images, up to 500 images in database

- 100: 97.2%
- 300: 93.2%
- 500: 93.2%
Speed

- Slow!! Runtime increases linearly
  - Averaged over 20 runs

100 : 43.3 s.
300 : 148.3 s.
500 : 205 s.
Future Work

- Implement faster search
  - Approximate methods: Locality Sensitive Hashing
- Enhanced features
  - Pricing, Feedback mechanism, find similar items
- Explore other uses
  - Inventory management, keyword search in books...
Questions & Comments?