Image Analysis of Historical Documents and Paintings

- Similarity-based Retrieval of Ukiyoe Paintings
- Authorship Identification of Ukiyoe by Using Rakkan Images
- Image Analysis of Historical Books

- Extraction and Matching of Rakkan Images
- Automatic Extraction of Rakkan Images
- Weighted Directional Histogram
- Identification Experiments

Rakkan Identification Results

<table>
<thead>
<tr>
<th>Character</th>
<th>Identification Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nagahide</td>
<td>100.0%</td>
</tr>
<tr>
<td>Bunkyo</td>
<td>98.8%</td>
</tr>
<tr>
<td>Toukyo</td>
<td>96.3%</td>
</tr>
<tr>
<td>Hirosada</td>
<td>90.0%</td>
</tr>
<tr>
<td>Sadanobu</td>
<td>90.0%</td>
</tr>
<tr>
<td>Kunichika</td>
<td>88.8%</td>
</tr>
<tr>
<td>Toyokuni</td>
<td>83.8%</td>
</tr>
<tr>
<td>Kunikazu</td>
<td>78.8%</td>
</tr>
<tr>
<td>Shuntei</td>
<td>75.0%</td>
</tr>
<tr>
<td>Hiroshige</td>
<td>72.5%</td>
</tr>
</tbody>
</table>

Rakkan Feature Extraction

- The weighted direction index histogram
  - Subdivided into 7x7 area
  - Gaussian filter
  - Direction Histogram
  - 64 (4x4x4) weighted direction index histogram