Fingerprint Classification

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Fingerprints

A fingerprint can be used by many organizations for many purposes:

• Police
• Biometric ID
• Security
Fingerprint’s Classes

Arch:
as we can see in the middle of the fingerprint the lines start to dive up and then back down, therefore making a little arch (in this case it's little).
Fingerprint’s Classes

Tented arch:
this is same as the arch but in this type of fingerprints the arch is much bigger.
Fingerprint’s Classes

Left loop:
as we can see in the middle of the fingerprint the lines coming from the right start to dive up and when they start to dive down they start going left and back to the right side where they come from, thus making a left loop by returning back.
Fingerprint’s Classes

Right loop:

as we can see in the middle of the fingerprint the lines coming from the left start to dive up and when they start to dive down they start going right and back to the left side where they come from, thus making a right loop by returning back.
Fingerprint’s Classes

**Whorl:**
as we can see in the middle of the fingerprint there is whorl thus the name of the class.
Algorithm
Results

- From 20 fingerprints there was 80% classifying success.

<table>
<thead>
<tr>
<th></th>
<th>Tentured Arch</th>
<th>Arch</th>
<th>Left Loop</th>
<th>Right Loop</th>
<th>Whorl</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Success</td>
<td>60%</td>
<td>100%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Number of pictures</td>
<td>3/5</td>
<td>5/5</td>
<td>4/5</td>
<td>4/5</td>
<td>4/5</td>
</tr>
<tr>
<td>Picture</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
</tr>
</tbody>
</table>
Conclusions

• We see that by classifying a fingerprint to 1 out of 5 classes we decrease the time needed to match a fingerprint to a database.

• The success rate is about 80%.

• Thus, on average we save 64% of the time to match a fingerprint.
Thank You!