Research Methods in computer science
Spring 2017

Lecture 19

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Agenda

HW9 live grading
Research Conference Updates
Legible Graphs
HW10
Example of a heatmap (red – high, blue – low)
Annotations
Overlapping legend
Legend order different from line order
Figure 2: The average minimum coverage achieved by various algorithms over 100 real-world data sets of 1M items each.

Figure 4: Experimental results for the Independent data set.
(c) Reliability with different blacklisting thresholds
We saw two common styles

Arrows and text

Legends
Tools

matplotlib
Gnuplot
Excel
Inkspace
Powerpoint

Learn about: Vector format, high resolution graphics
Screen captured images

Zoom in before capture
Start with a large image

Ideally start with a vector image
Font size
Fig. 4. Performances of various structures for a number of link-interference related problems.

Fig. 5. Minimize the maximum link interference with different spanning ratio requirements.

Unusual placement of legends
Font size of axis labels too small
Just one idea to improve all your graphs

Increase the font size
Range
These graphs do not use consistent y-axis range so hard to compare across graphs
Idea #1 Range of the metric
Idea #2 Range of the observed values
Caption

Should be mostly self-contained
Don’t just describe the lines
Figure 7: CDF of the interval between door open events. For most door open events, the CDF of the distribution is between 1 and 10 seconds. This suggests that most door open events occur with a short interval between them.

Figure 8: Recharge rate in varying lighting conditions. We observe that the recharge rate increases with increasing light levels. This is expected as the sensor is more active under brighter conditions.

Figure 9: Energy consumption for different lighting conditions. The graph shows that the energy consumption is lowest under dim lighting conditions and highest under bright lighting conditions. This is consistent with the observation that the sensor is more active under bright conditions.

Table 1: Summary of results.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Recharge Rate (s)</th>
<th>Energy Consumption (J)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dim light</td>
<td>1-10</td>
<td>0.1</td>
</tr>
<tr>
<td>Medium light</td>
<td>1-10</td>
<td>0.5</td>
</tr>
<tr>
<td>Bright light</td>
<td>1-10</td>
<td>1.0</td>
</tr>
</tbody>
</table>

In conclusion, the BigBen system demonstrates promising potential for energy-efficient and responsive automated door control systems. The system is capable of detecting door open events with high accuracy and can recharge its battery efficiently in varying lighting conditions.

Reference:
HW10 – Your Idea

Describe your idea. Your idea could be an approach, algorithm, or a system.