Text Layout in GTK+ World
Text Layout

Text layout is decided by the author.
Text Layout

- **HTML:**
  
  ```html
  <p>Dynamically loaded modules then handle text layout for particular combinations of script and font backend. Pango-1.10 ships with a wide selection of modules, including modules for Hebrew, Arabic, Hangul, Thai, and a number of Indic scripts. Virtually all of the world’s major scripts are supported.</p>
  ```

- **TeX:**
  
  Dynamically loaded modules then handle text layout for particular combinations of script and font backend. Pango-1.10 ships with a wide selection of modules, including modules for Hebrew, Arabic, Hangul, Thai, and a number of Indic scripts. Virtually all of the world’s major scripts are supported.
Layout Engine

Typesetting
Line Breaking
Font
Glyph Metrics

- EM-Box
- Glyph metrics:
  - Bearings
  - Advance
Vertical Glyph Metrics
Font Metrics

- Ascender
- Descender
- Leading
Wrong Metrics

A number of popular commercial desktop publishing systems use modified versions of the original TeX typesetting engine.
• TR #9: The Bidirectional Algorithm
• TR #14: Line Breaking Properties
• TR #29: Text Boundaries
Unicode and OpenType

- Context awareness
- Substitution
  \( (\times) \rightarrow \hat{\times} \quad f + i = fi \)
- Positioning
Pango

- Multiple backends
- Font management
- Glyph rendering
- Unicode support
- OpenType layout support
- Can be device independent
GTK+ and Text

- Recent distributions

- OpenMoko (GTK+ 2.6)
Rendering Difficulties

Glyph rasterization
Quantized metrics
Hinting
Anti-Aliasing
Subpixel Rendering
Subpixel Rendering

This is a very long paragraph to be wrapped over several lines.
Subpixel Rendering


<table>
<thead>
<tr>
<th>autohint</th>
<th>grayscale rendering</th>
<th>kerning / deltas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>autohint</td>
<td>light LCD filter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kerning / deltas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>using no LCD filter</td>
</tr>
</tbody>
</table>

Device Independence

This is a very long paragraph that will need to be wrapped over several lines so we can see what happens to line-breaking as the view is zoomed in and out.

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Is pango device independent?