Automatic Interpretation of Figurative Language: Logical Metonymy and Metaphor
• What is figurative language?

*kill* a process

*computer virus*

*capture* an idea

*thoughts that creep into your mind*

*I invested* a lot of time in this work
• Why do we need to interpret figurative language?

• Where do we find the required knowledge?

   In text corpora

• How do we extract and use this knowledge?

   In the form of distributional semantics
Logical Metonymy

- Logical Metonymy
  
  *enjoy ... the book*
  *begin ... a cigarette*
  *finish ... the novel*

- The Model

\[
P(e,v,o) = \frac{f(v,e) \cdot f(o,e)}{f(e) \sum_i f(e_i)}
\]

where \( e \) is the eventive interpretation
\( v \) is the metonymic verb, \( o \) is the noun compliment
\( f(e), f(v,e) \) and \( f(o,e) \) are the respective frequencies

- Output

<table>
<thead>
<tr>
<th>Word</th>
<th>Value</th>
<th>Action</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>read</td>
<td>-15.68</td>
<td>publish</td>
<td>-20.06</td>
</tr>
<tr>
<td>write</td>
<td>-17.47</td>
<td>read through</td>
<td>-20.10</td>
</tr>
<tr>
<td>work on</td>
<td>-18.57</td>
<td>recount in</td>
<td>-20.13</td>
</tr>
<tr>
<td>look at</td>
<td>-19.09</td>
<td>throw</td>
<td>-20.15</td>
</tr>
<tr>
<td>read in</td>
<td>-19.10</td>
<td>look for</td>
<td>-20.18</td>
</tr>
<tr>
<td>write in</td>
<td>-19.73</td>
<td>make</td>
<td>-20.18</td>
</tr>
<tr>
<td>browse</td>
<td>-19.74</td>
<td>look in</td>
<td>-20.27</td>
</tr>
<tr>
<td>get</td>
<td>-19.90</td>
<td>take</td>
<td>-20.30</td>
</tr>
<tr>
<td>re-read</td>
<td>-19.97</td>
<td>find</td>
<td>-20.47</td>
</tr>
<tr>
<td>talk about</td>
<td>-20.02</td>
<td>look through</td>
<td>-20.49</td>
</tr>
<tr>
<td>see</td>
<td>-20.03</td>
<td>go through</td>
<td>-20.54</td>
</tr>
</tbody>
</table>

- Sense Disambiguation

- Clustering
• Metaphor

*capture the idea*

*kill a process*

*the idea is buried in terribly dense paragraphs*

• The Model

\[
P(i, x_1, d_1, x_2, d_2, \ldots, x_N, d_N) = \frac{\prod_{n=1}^{N} f(x_n, d_n, i)}{(f(i))^{N-1} \sum_k f(i_k)}
\]

where  \( i \) is the interpretation,
\( x_1 \ldots x_N \) is the context,
\( d_1 \ldots d_N \) are the dependencies

• Conceptual Mappings:

*ideas as physical objects*
Thank you!

Questions?