Machine Translation

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Machine Translation

• Process of translating from one language to another.
• Translation requires a deep and rich understanding of language.
• Direct translation:

As she lay there alone, Dai-yu’s thoughts turned to Bao-chai... Then she listened to the insistent rustle of the rain on the bamboos and plantains outside her window. The coldness penetrated the curtains of her bed. Almost without noticing it she had begun to cry.

dai yu zai zai chuang shang gan nian bao chai...
Dai-yu alone on bed top think-of-with-gratitude Bao-chai
you ting jian chuang wai zhu shao xiang ye zhe again listen to window outside bamboo tip plantain leaf of
shang, yu sheng xi li, qing han tou mu,
on-top, rain sound sigh drip, clear cold penetrate curtain,
bu jue you di xia lei lai.
not feeling again fall down tears come.
Some Current Uses

- **Rough Translation**
  - Rough Translation
  
  ![Translate Text](image)
  
  Original text:
  Dar a conocer la gastronomía típica de la zona durante las distintas excursiones y visitas en Navarra. Los menús se adaptan a las características del grupo y a su calendario de actividades.
  
  Automatically translated text:
  Spreading the typical cuisine of the area during different tours and visits in Navarra. The menus are tailored to the characteristics of the group and its calendar of events.

- **Human Editing** (*ComputerAidedHumanTranslation*)
  - Automated, but corrected
  - Extending products to new markets, Software manuals, jobs with quick turnarounds

- **Small Sublanguage Domains**
  - Weather Forecasting, Equipment maintenance manuals, air travel queries, appointment scheduling
Language Similarities & Differences

- **Typology**
  - Basic word order:
    - SVO: English, French, Mandarin, ...
    - SOV: Hindi, Japanese, ...
    - VOS: Irish, Classic Arabic
  - Prepositions vs. Postpositions
  - Isolating vs. Polysynthetic
    - Mandarin – tā zài tūshūguǎn kàn bào
      he at library read newspaper
      “He’s at the library reading a newspaper.”
    - Southern Tiwa – ‘U-ide tow-keuap-wia-ban
      child-A 1S:C:A-shoe-give-PST
      “I gave the shoes to the child”
  - Agglutinative vs. Fusional
    - Nahautl no-kali-mes
      my-house-PL
    - Ancient Greek lu-omai
      1S:PRES:PASS:IND - “I am being released”
Other Differences

- Specificity

<table>
<thead>
<tr>
<th>English</th>
<th>brother</th>
<th>Japanese</th>
<th>otooto (younger)</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Japanese</td>
<td>oniisan (older)</td>
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<td>Mandarin</td>
<td>gege (older)</td>
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<td>Mandarin</td>
<td>didi (older)</td>
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<tr>
<td>English</td>
<td>wall</td>
<td>German</td>
<td>Wand (inside)</td>
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<td></td>
<td></td>
<td>German</td>
<td>Mauer (outside)</td>
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<tr>
<td>English</td>
<td>know</td>
<td>French</td>
<td>connaître (be acquainted with)</td>
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<tr>
<td></td>
<td></td>
<td>French</td>
<td>savoir (know a proposition)</td>
</tr>
<tr>
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<td>they</td>
<td>French</td>
<td>ils (masculine)</td>
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<td></td>
<td></td>
<td>English</td>
<td>mountain</td>
</tr>
<tr>
<td>Mandarin</td>
<td>tā</td>
<td>English</td>
<td>he, she, or it</td>
</tr>
</tbody>
</table>

Figure 21.1 Differences in specificity.
The Transfer Metaphor

Figure 21.3  The transfer architecture for Machine Translation.
Transfer Metaphor in Action

1) Add go to mark the subject
2) Choosing the verb agreeing in animacy
3) Inflecting the verb
Interlingua
Sapir-Whorf hypothesis

- Language may constrain thought
  - The way you speak may affect the way you think
- No perfect translation exists