FAUST
Feedback Analysis for User Adaptive Statistical Translation

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Project Overview

Objective

Develop interactive machine translation systems which adapt rapidly and intelligently to user feedback

Translation Language Pairs


Project Duration

1 February 2010 – 31 January 2013

Seventh Framework Programme

Theme FP7-ICT-2009-4
Objective 2.2: Language-based interaction
Grant agreement no. 247762 (STREP)

Budget

3.76 Meuro (funded at 2.85 Meuro)

Website

http://divf.eng.cam.ac.uk/faust

Coordinator

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Project Partners

- **Academic Partners**
  - University of Cambridge, UK
  - Universitat Politècnica de Catalunya, Spain
  - Charles University, Czech Republic

- **Commercial Partners**
  - Language Weaver Inc., USA
  - Language Weaver SRL, Romania
  - Softissimo, France
• Current MT systems do not respond to suggestions for improvement. There are diverse technical reasons for this, including:

  • User feedback tends to be very noisy

  • No research published to date makes explicit how statistical translation and language models can be adapted to benefit from feedback provided by web users

  • No mechanisms exist to identify user feedback of value

  • No mechanisms exist for immediately affecting the behavior of a statistical MT system so that subsequent users do not run into the same problem

  • As a consequence users are passive and unable to contribute to any improvement in SMT
Project Motivation - 2

• Current SMT systems and research efforts are aimed at sophisticated users - translation professionals, intelligence analysts, etc. These users develop an understanding of how to work around their system weaknesses

• Casual users are tend to be frustrated by a general lack of fluency
  • In any NLP system, basic mistakes in grammar or word sense suggest that the technology is not reliable
  • Systems must be fluent if they are to be accepted and trusted by casual users
Research opportunities in improving commercial MT

- Language Weaver and Softissimo: Reverso.net
- Popular translation service: 2nd most popular; most visited site in Europe
- Many users - ideal for deploying and studying new translation techniques
Research Challenge: Incorporation of User Feedback

- Unexploited user feedback from users of the Reverso.net website
- Plenty of feedback, but noisy
- Unclear how it should be used

<table>
<thead>
<tr>
<th>Translation request</th>
<th>MT output</th>
<th>User feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wie steht mir die Farbe?</td>
<td>How does the color stand to me?</td>
<td>How does the color look on me?</td>
</tr>
<tr>
<td>je m’appelle hamza</td>
<td>I apelle hamza me</td>
<td>my name is hamza</td>
</tr>
<tr>
<td>Il y a combien de temps que tu pratiques la gymnastique ?</td>
<td>There is how that you practise the gymnastics?</td>
<td>How long ago did you practice gymnastics?</td>
</tr>
<tr>
<td>j’ai laisser une note</td>
<td>I have to leave a note</td>
<td>I have left a note</td>
</tr>
<tr>
<td>DESOLEE JAI BEAUCOUP DE MAL AUJOURDHUI</td>
<td>SORRY I HAVE DIFFICULTY AUJOURDHUI</td>
<td>SORRY I HAVE DIFFICULTY TODAY</td>
</tr>
<tr>
<td>bonjour comment vas tu</td>
<td>Hello how go you</td>
<td>Hello how are you you</td>
</tr>
<tr>
<td>quand mon père viendra me rechercher</td>
<td>When my father will come to look for me</td>
<td>When my father will come pick me up</td>
</tr>
</tbody>
</table>
Project Goals – Scientific and Technological Innovation

1. Enhance the high-volume, reverso.net translation website with an **experimental and evaluation infrastructure** for the study of instantaneous user feedback
   - State of the art: High-volume translation without real-time adaptation.
   - FAUST: high-volume translation systems capable of adapting to user feedback in real-time.

2. Deploy novel **web-oriented, feedback collection mechanisms** that reduce noise and increase the utility of the web contributions
   - State of the art: Simple user feedback collection
   - FAUST: feedback from users guided to improve specific translation weaknesses automatically identified by the SMT system
Project Goals – Scientific and Technological Innovation

3. Automatically acquire novel data collections to study translation as informed by user feedback

State of the art: static data collections collected and evaluated independently of user interest

FAUST: collections created and evaluated by interested users

4. Develop mechanisms for instantaneously incorporating user feedback into the machine translation engines used in 24x7 production environments

State of the art: no published results on instantaneous machine translation adaptation to user feedback.

FAUST: translation models and mechanisms that adapt instantaneously
Project Goals – Scientific and Technological Innovation

5. Create novel **automatic metrics of translation quality** which reflect preferences learned from user feedback

   State of the art: MT relies on metrics which do not reflect user interest

   FAUST: MT metrics as models of user feedback

6. Develop new **translation models based on user feedback data** and develop novel approaches to integrate natural language generation directly into MT to **improve translation fluency and reduce negative feedback**

   State of the art: Corpus-level optimization of `translate and forget' MT systems

   FAUST: User-driven MT systems
Project Highlights – Public Outputs, Community Benefits

• FAUST will create new additions to the Reverso.net translation services:
  • labs.reverso.net: research MT systems will be deployed directly on so that researchers can observe users interacting directly with MT systems.
  • forums.reverso.net: will provide a meeting place for translation users to interact with each other and to experiment with novel feedback collection mechanisms.

• Commercial spinoffs, derivatives
  • any developments fielded by Language Weaver and Softissimo
Possible next steps - beyond the current scope

- Finding Groups and Communities of MT Users (and users of other language technologies)
  - Goal: Find large multilingual collections and the people who need to access them
  - Identify research problems outside the scope of the localization and translation industry
  - Not a ‘grand challenge’
    - Aim is to identify a large number of research problems and market opportunities
  - Emphasis on language technology resources would be secondary
    - Would be complementary to activities of ELRA, FLARENET, etc.
    - Potential strategy: provision and support for free online translation services in exchange for learning about the applications envisioned by users
    - Willing users and their resources could then be invited into funded research projects
      - researchers preparing proposals could select potential application areas for their projects