

Speaking one's mother tongue, be it Latvian, Hungarian, or Portuguese must not become a social or economic disadvantage in the networked European society of the 21st century. Language Technology (LT) has the potential to become the key solution to this challenge if it is robust, cost-effective and available for all European languages and to all European citizens. In order to achieve these goals the pace of research and development has to be accelerated by a major, dedicated push. A push on this level and with the magnitude needed can only be put into motion through a joint action of all stakeholder groups involved. This highly diverse group consists of researchers, user and provider industries, technology integrators, language communities, administrators, politicians, journalists and society in general.

META-NET is a Network of Excellence forging the Multilingual Europe Technology Alliance (META) through a concerted effort to build a strong European community around LT. Its goal is to prepare the grounds for applications that enable automatic translation, multilingual information and knowledge management as well as content production across all European languages. This effort will enhance the development of intuitive language-based interfaces to technology ranging from household electronics, machinery and vehicles to computers and robots. The objective is to advance LT so that communication and cooperation across languages becomes possible and to secure users of any language equal access to information and knowledge.

META-VISION: Building a community with a shared vision and strategic research agenda

META-SHARE: Building an open resource exchange infrastructure

META-RESEARCH: Building bridges to neighbouring technology fields

We aim to further LT as a means towards realising the vision of a Europe united as one single digital

market and information space. META-NET is supporting these goals by pursuing three lines of action:

1. META-VISION. This action line is concerned with bringing together the fragmented European LT community and with collaboratively preparing, establishing and promoting a Strategic Research Agenda (SRA) for European LT. The SRA is a long-term instrument. It covers the period until 2020 and is an umbrella for industrial and academic research. The SRA contains recommendations and suggestions for joint actions to be presented to the European Commission and national as well as regional bodies. The complex process of preparing the SRA includes Vision Groups that consist of external experts from industry, who provide ideas for innovative LT applications and scenarios for the future knowledge society. The META Technology Council consolidated their findings into the SRA.

2. META-SHARE. META-NET is building META-SHARE, a sustainable network of repositories of language data, tools and web services documented with high-quality metadata, aggregated in central inventories allowing for uniform search and access to resources. Data and tools can be open and with restricted access rights, free and for-a-fee. META-SHARE targets exist-

ing but also new and emerging language data, tools and systems required for building and evaluating new technologies, products and services. Reuse, combination, repurposing and re-engineering of language data and tools are crucial. META-SHARE will be an important component of an LT marketplace for researchers and developers, language professionals, as well as for industrial players including SMEs and big enterprises.

3. META-RESEARCH. This line of action is carrying out innovative Machine Translation (MT) research by building bridges to other fields and disciplines such as Machine Learning and the Semantic Web community. Central goals are bringing more semantics into MT, optimising the division of labour in hybrid MT, exploiting the context for Translation and preparing an empirical base for MT. Research included, among others, the implementation of prototypes, the preparation of data sets for evaluation purposes and the organisation of internal workshops. This research was meant to advance significantly the state of the art in MT.

Activities and Results from the Third Year

The highlights of the third and final project year include key achievements in all three lines of action. As an important prerequisite for reaching its ambitious goals, the **META-VISION** arm of the project has continued building up a coherent and homogeneous LT community in Europe by bringing together representatives from various stakeholder groups (researchers, user industries, provider industries, administrators, politicians, integrators etc.) at various meetings, events and conferences organised by both META-NET and also in cooperation with the community. Significant steps towards this goal have been taken through means such as, for example, successfully mobilising more than 200 experts from industrial and academic research to participate actively in the discussion and preparation of the Strategic Research Agenda. After several iterations and rounds of discussion the SRA was published online in December 2012. Another important milestone was the publication of the META-NET White Paper Series in September 2012. The series consists of 31 volumes reporting on the level of support LT provides for 30 European languages. The corresponding press campaign on occasion of the European Day of Languages (Sep. 26) had a huge impact: it generated more than 600 mentions in the international press, and dozens of television and radio interviews about META-NET's work and the outcome of the study. Furthermore, META-NET has been engaged in intense dissemination and communication activities. In 2012 these include, among others, presentations at LREC 2012 (May, Istanbul), the Multilingual Web Workshop (June, Dublin), EFNIL 2012 (October, Budapest) and COLING (Mumbai, December). In addition to the wide visibility provided by successful dissemination and mobilisation activities, META-NET organised or co-organised several conferences of its own as well as a number of workshops: workshop and challenge "Machine Translation and Multimodal Contexts" at ICANN 2012 (September, Lausanne), workshop and shared task ML4HMT 2012

(December, Mumbai) and several workshops at LREC 2012 (May, Istanbul). More than ten dedicated META-NET Roadshow Events were organised by members of our Network of Excellence in countries throughout Europe. The main event of the final year was META-FORUM 2012 (June 20/21, Brussels), which attracted over 250 participants; a satellite expo event featured more than 40 exhibits, many of them from industry



and collaborating projects. At META-FORUM 2012 delegates met to learn more about the Strategic Research Agenda (its composition and priority research themes), Europe and its languages (the EFNIL perspective) and Language Technology made in Europe.

In 2012, **META-SHARE** has developed on all fronts, from refining, crystallising and widely deploying the language resources (LRs) metadata model, the functionalities of the platform, the legal framework, the basic operational procedures of the infrastructure to the implementation of versions 2.0 and v3.0 of the META-SHARE software, their releases to the META-NET Network of Excellence and the greater public, the setup of over 20 repositories and their population with language related datasets and processing tools. The metadata model has been updated to v3.0 accommodating adjustments on specific components and elements following extensive user feedback. META-SHARE versions 2.0 and 3.0 were implemented, including several intermediate iterations as follows: v2.0 was released in March 2012, followed by an improved v2.1 and a v2.9 beta pre-release that was demonstrated at META-FORUM 2012. Constantly in contact with the META-SHARE user base in order to get feedback, additional or improved features of core functionality of META-SHARE were implemented and the underlying distributed framework was completed. A fully-fledged user management system was also created and integrated, including different user roles and privileges tailored to LRs sharing. For all major versions, tools were created for easily migrating an existing META-SHARE node to the latest version. META-SHARE v3.0 was released in October 2012 and demonstrated at various national LT Days at the end of 2012 and in early 2013. By the end of January 2013, twenty distinct META-SHARE repositories had been installed, with a total of over 1,900 LRs. Three dedicated helpdesks have been in operation since October 2011 to support LRs providers in all their META-SHARE related activities. META-SHARE has been presented in relevant fora, such as LREC 2012, a wide range of workshops and national/ regional events, and naturally META-FORUM 2012 and the 2nd META-NET Network Meeting in early 2013.

META-RESEARCH followed the course and directions of work, building up on results achieved in years 1 and 2 of the project in all four key areas: “Semantics in MT”, “Hybrid MT”, “Context in MT”, and “Novel use of large data resources”. There have again been about 70 publications in 2012 and published or accepted in 2013 to this date. The most visible ones appeared at the

WMT 2012 workshop, at COLING and at the ICANN 2012 conference. META-RESEARCH also contributed several datasets, mostly related to the two challenges organised by several META-RESEARCH sites: ML4HMT challenge organised in 2011/2012 which resulted in several papers presented at the ML4HMT workshop at COLING 2012 in Mumbai, and the second one, organised as part of the ICANN 2012 conference which draws the Machine Learning community. Work has also continued on the use of semantics in Machine Translation, and in the area of applying heavy ML methods to the task of deep parsing and/or translation using such deep analysis. The hybrid MT work has been accepted for presentation at the AAI 2013 conference in San Francisco, another successful step towards building bridges toward the AI and ML communities.

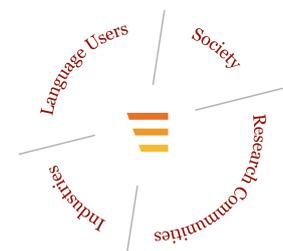
Final Results, Impact and Use

We expect META-NET to have a significant, unprecedented long-term impact on the European LT landscape. The three lines of action all aim at the same goal, albeit on different levels: to provide technological antidotes for the language barriers Europe has been facing for quite some time, in the form of robust, precise, high-performance, multilingual LT, to foster the development of innovative applications, to assemble and to strengthen the European LT community and to raise awareness about the enormous potential of LT for the European information society and the society at large.

In META-RESEARCH, novel MT approaches have been developed in close collaboration with neighbouring fields, establishing and strengthening ties to other research areas. META-SHARE is closing a gap that has been wide open for decades. The successful implementation of a distributed peer-to-peer network for the distribution and sharing of language resources and technologies enables researchers, SMEs and large industrial players quickly to build systems that employ monolingual, crosslingual or multilingual LT. META-VISION provides a long-term plan for our mission of realising a truly multilingual Europe, which is based on robust LT. An important objective of META-NET is to assemble a coherent, convincing, powerful community around LT, i.e., researchers, industrial players, journalists, politicians, administrators, language communities and several others. This community building effort along with the process of assembling Vision Groups as well as the META Technology Council progressed very successfully. One of the key deliverables of META-NET, the Strategic Research Agenda, was presented publicly at META-FOURM 2012 and published in December 2012. It contains visions, plans and roadmaps for the path to a truly multilingual Europe, realised through high-performance, robust and precise LT.

Coordination & Contact

Prof. Dr. Hans Uszkoreit,
 Dr. Georg Rehm
 DFKI GmbH, LT Lab
 Alt-Moabit 91c
 10559 Berlin, Germany
 georg.rehm@dfki.de



<http://www.meta-net.eu>