D4.8 – Module for cross-lingual chat support

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D4.8	Abstract / Introduction
This document describes different modules for cross-lingual chat support. The ALIAS robotic system should help users to communicate with other people. Therefore, a telephone functionality based on Skype is integrated. Skype also comes with a chat functionality. Adding a possibility to translate chat messages into other languages enables users to communicate with foreign people who do not speak their language. This deliverable provides an overview over the system and compares several software solutions for cross-lingual chat.	

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Content

1 Introduction

The objective of the project Adaptable Ambient LIving ASsistant (ALIAS) is the product development of a mobile robot system that interacts with elderly users, monitors and provides cognitive assistance in daily life, and promotes social inclusion by creating connections to people and events in the wider world. The system is designed for people living alone at home or in care facilities such as nursing or elderly care homes. The function of ALIAS is to keep the user linked to the wide society and in this way to improve her/his quality of life by combating loneliness and increasing cognitively stimulating activities. ALIAS is embodied by a mobile robot platform with the capacity to monitor, interact with and access information from on-line services, without manipulation capabilities. ALIAS is not designed to replace human-human contacts, but rather, to enhance and promote these through the proposed integrated services. By serving as a monitor, a cognitive-prosthetic device and a facilitator of social contacts, the ALIAS system will significantly improve the daily life of elderly people.

One of the ways to enhance human-human contacts is a chat module. Using such a tool, elderly people living alone at their homes can stay in contact with their relatives and friends, and even make new friends or get to know other people who share their interests. In this way, social inclusion is improved.

1.1 Chat Module

A chat module is a program which enables a user to send text messages to other users. Compared to a conventional telephone call, using a chat program has several advantages and disadvantages. In a telephone call, both parties can directly communicate with spoken language. Therefore, no additional devices such as a keyboard or screen are necessary. This simplifies communication compared to a chat program. In such a program, an input and output device is required. The input device can be a keyboard or a touch-screen with a software-based keyboard. The most simple output device is just a screen, where the incoming chat messages are displayed. Furthermore, modern input modalities like speech recognition can be used for dictating text messages. Looking at the ALIAS system, there are several input modalities available. The robot has a touch-screen with a graphical user interface (GUI), where a software keyboard is implemented. This would be the primary input modality for such a chat module. Furthermore, a complete dialogue system is integrated on the robot. This system mainly consists of a speech recognition system, a dialogue manager, and a speech synthesis module. These modules could also be combined with such a chat module. As a result, the simplicity of a telephone call is reconstructed – the user can use natural spoken language for communicating. Of course, the speech recognition system will make some mistakes and mis-recognise some words. While input and output is more complicated in a chat module, compared to a telephone call, there are more possibilities to further enhance such a chat module. With a telephone call, multi-party interaction is

possible, by using a conference mechanism, where multiple persons are connected in one telephone call. However, in such a conference call, it will soon become rather confusing and unclear, who is speaking, etc. With a chat module, more users can communicate with each other at the same time. There are also limits, regarding the maximum number of participants, but in general, a chat module can handle more persons at the same time compared to a telephone call. The reason for that is that the messages are written, and thus, a user can more easily go back and read past messages, which is one of the main advantages of a chat conversation compared to a conventional telephone call. This helps to give a better overview about what happened in the last seconds. Compared to that, when in a telephone conference with multiple participants, more people are speaking at the same time, nobody will understand what was spoken. The fact that the incoming text messages are saved is another advantage of a chat module on its own. All conversations can automatically be saved, and thus, users can later come back and read the protocol of the conversation. Furthermore, a written form makes it easier to browse or search the history. In speech communication, there is also research going on in this direction, however, technology is not yet mature enough to be used for such functionalities for telephone calls. Especially for the target group of ALIAS, elderly people, the advantages of a chat module, compared to a conventional telephone, are very convincing. For example, people with light dementia might very frequently use the chat history. Thus, such a chat module is perfectly suited for the ALIAS system.

1.2 Cross-lingual Chat Support

In a chat system, messages are represented in a textual form. This provides easy access to the actual contents of these messages and allows for a convenient interface to integrate additional technologies. Integrating a speech translation module into the chat module enables cross-lingual chat. This enables users to communicate with one another, even if they're unable to speak the same language. In the past few years, technology in the field of automated text translation has evolved significantly; several viable consumer products like Google Translate have emerged on the market. Today it is not only possible to translate isolated words, but also complete sentences with a complex grammar. Furthermore, powerful translation modules for more and more languages exist. Using such a translation module within the ALIAS system is a perfect way to pursue the goals of the project.

The ALIAS communication system is centered around the GUI and its integrated modules. One of the modules is a telephone module based on Skype, providing the possibility to make telephone calls. Skype also comes with a chat functionality, enabling the user to communicate via text messaging, also. This is the perfect opportunity to integrate a module for cross-lingual chat support. Such a module can be used in conjunction with the chat functionality of Skype.

1.3 Structure of this Document

This document is structured in the following way: The ALIAS communication system, centered around the GUI and including various ways for communicating with other users, is presented in Section 2. Various available modules for cross-lingual chat support are discussed in Section 3. The conclusions are given in Section 4.

2 ALIAS Communication System

The robotic assistant developed in the ALIAS project is equipped with a comprehensive communication system. First of all, the user needs to communicate with the robot itself. Providing an easy-to-use interface to such a technical system improves user acceptance and makes it easier, also for less experienced users, to use such a system. There are several ways of interacting with the robot. The most intuitive way is using natural speech. Therefore, a speech recognition system is integrated, which processes user inputs. Recognised speech utterances are forwarded to the dialogue manager (DM), which processes all communication going on in the robot. Input from the speech recognition system is processed in the natural language understanding (NLU) unit of the DM. Dependent on the user input, corresponding actions are triggered by the DM. First, menu navigation in the GUI can be achieved with speech commands. The user can navigate through the menu implemented in the GUI with speech commands, by naming the desired sub menu or module to be started. All integrated modules can be activated with speech commands. The user gets feedback from the robot through the speech synthesis module. A text-to-speech (TTS) technology is integrated, which is controlled by the DM.

In order to provide a technology which enables communication with other users, a telephone module is integrated into the ALIAS system. This module is based on Skype, which comes also with a chat functionality. Enhancing the chat functionality of Skype with a module for cross-lingual chat support provides the possibility to communicate with users who are not speaking the same language. This supports the social inclusion of ALIAS users. The telephone functionality is embedded in the GUI, which is described in the next section.

2.1 ALIAS GUI

The simplest way of controlling the ALIAS system is by using the touch-screen in combination with the GUI. The menu structure is displayed on the GUI, where it is possible to start all integrated modules. One of the main menus in the GUI includes the communication modules, where the most important are a telephone functionality and a web browser. This menu is displayed in Figure 1. The telephone functionality is based on Skype, that is integrated into the GUI. This telephone module can also be started by natural speech commands, as it is possible with all other modules. Furthermore, it can be controlled through the touch-screen. It is then possible to start a telephone call to one of the entries in the contact list. Then, a normal telephone call can be performed, whereby the loudspeakers of the ALIAS system are used as an output device. Speech is recorded with the microphones integrated into the display and forwarded to the telephone module. Furthermore, Skype provides the possibility to chat with users in the contact list. A chat communication can be performed by using the keyboard as an input device, while the received messages are displayed on the display.

2.2 Chat Module

The integration of a translation module into the chat module is displayed in Figure 2. In this figure, only the communication in one way is displayed. Analogously, communication in the other way is performed. Without the translation module, the input messages from the user are directly transmitted to the other communication partner. When the translation module is enabled, all messages are transmitted through this module.

Figure 1: ALIAS GUI with the communication modules

Messages generated by the user are fed to the translation module, which uses machine translation techniques to translate the message to the desired target language. Instead of

the original message, the translated message is then sent to the communication partner.

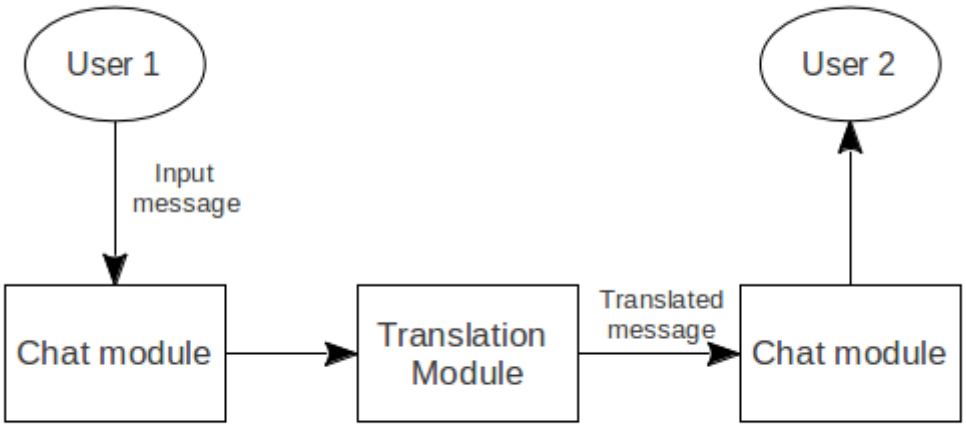

Figure 2: Integration of the translation module into the chat functionality

In this way, a cross-lingual chat can be performed. In the ideal case, the translation module covers a wide variety of different languages. For all pairs of languages, back and forth translation is necessary. Therefore, the necessary number of translation pairs grows quadratically with the number of integrated languages. Another possibility is to perform a two-way translation. Thereby, the input from an arbitrary language is first translated to English, and then this message is translated into the target language. With this method, a smaller number of translation pairs is necessary. The advantage is that, if a new language is added to the system, only translation to/from English is necessary. In the first option, when a new language is added to the system, translation to all other languages should be possible. If a translation module covers a large number of possible languages, it is more attractive to the users. In this case, the user can choose from a large pool of languages, which makes it possible to communicate with a large number of people from different countries.

3 Chat Translator Modules

In this section, we will describe and discuss several software modules which are available as translation modules for the Skype chat functionality. Important properties of such modules include the number of supported languages, the price of the software and the usability.

3.1 Skype Translate

The most widespread tool for Skype chat translation is called “Skype Translate”.

Link: http://www.skypetranslate.com/

Skype Translate is a tool that allows to translate chat messages in real time during a text chat on Skype. When the tool is started, it is conveniently placed in the system tray, from where the settings of the tool can be set. The languages for the two communicating partners can be chosen there. After the languages are selected, text can be typed in the selected input language and will displayed in the chosen language of the other user at his side. Furthermore, it is possible to automatically select the language of the communicating partner, depending on his profile information.

This software supports 51 languages, as specified in the following list.

Supported Languages: Afrikaans Albanian Arabic Belarusian Bulgarian Catalan Chinese Croatian Czech Danish Dutch English Estonian Filipino Finnish French Galician German Greek Hebrew Hindi Hungarian Icelandic Indonesian Irish Italian Japanese Korean Latvian Lithuanian Macedonian Malay Maltese Norwegian Persian Polish Portuguese Romanian Russian Serbian Slovak Slovenian Spanish Swahili Swedish Thai Turkish Ukrainian Vietnamese Welsh Yiddish

The software is available for Windows operating systems starting from Windows XP and newer. It can be downloaded and used free of charge.

3.2 STranslator

Another available tool for Skype chat translation is called “STranslator”. It is advertised as an “Instant chat translator for Skype”.

Link: http://www.softpedia.com/get/Internet/Chat/Other-Chat-Tools/STranslator.shtml

STranslator is a professional utility which is designed to enable its users to communicate with other users who do not speak the same language. It can be used to make new friends from all over the world and chat with them in their native language.

When STranslator is activated during a Skype chat session, the user can write in his own language and STranslator will translate the message and send the translated version to the communication partner. In addition, the original message will also be sent.

This software is also free of charge for download and usage and it is available for operating systems Windows XP and newer.

3.3 CTSS – Chat Translator and Speaker for Skype

The third software for chat translation presented in this document is called "CTSS – Chat Translator and Speaker for Skype".

Link: http://blogs.skype.com/2009/05/19/ctss-chat-translator-and-speak-1/#fbid=r3hA7NuGk9P , http://saveontelephoneservices.com/modules.php?name=News&file=article&sid=13

CTSS can translate Skype chat messages in 43 different languages in real-time. Figure 3 shows a screenshot of this software.

Figure 3: CTSS Chat Translator and Speaker for Skype

List of languages: Albanian, Arabic, Bulgarian, Catalan, Chinese Simplified, Chinese Traditional, Croatian, Czech, Danish, Dutch, English, Estonian, Filipino, Finnish, French, Galician, German, Greek, Hebrew, Hindi, Hungarian, Indonesian, Greek, Italian, Japanese, Korean, Latvian, Lithuanian, Maltese, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Slovenian, Spanish, Swedish, Thai, Turkish, Ukrainian, Vietnamese

CTSS provides three different functions. It can read out received chat messages, translate chat messages and teach new languages.

3.4 Chat Translator for Skype 4.1.1

Another tool which provides the capability to translate Skype chat messages is called “Chat Translator for Skype 4.1.1”.

Link: http://www.chat-translator.com/products/chat-translator-skype.html

For this software, a free and a pro version are available. Chat Translator for Skype is designed to help users to translate Skype chat messages in 15 different languages. Translation is performed in real time.

3.5 Universal Language Real-Time Chat Message Translator Skype Version

The last tool presented in this document is called “Universal Language Real-Time Chat Message Translator”.

Link: http://virtualphonecalling.com/modules.php?name=News&file=print&sid=9

This software supports 35 different languages: Arabic, Bulgarian, Catalan, Chinese Simplified, Chinese Traditional, Croatian, Czech, Danish, Dutch, English, Filipino, Finnish, French, German, Hebrew, Hindi, Indonesian, Greek, Italian, Japanese, Korean, Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Serbian, Slovak, Slovenian, Spanish, Swedish, Ukrainian, Vietnamese

This software module translates Skype chat messages in real-time from and to many different languages, using the internet browser. Furthermore, it has the ability to translate old archived messages. A concept called double-translation is used, meaning that the translated chat messages are fed back to the user to give feedback how it was translated. Machine language translation as integrated into this software has an accuracy of 70-80%, so it is not perfect.

3.6 Discussion

Considering that several solutions exist for the problem of a chat translator, the question arises, which module is best suited for the ALIAS system. One aspect of the different systems is the list of languages, where more languages help to enlarge the possible group of target users. Therefore, “Skype Translate” with its 51 supported languages is the best among the compared software modules. Furthermore, “Skype Translate” is one of the most widespread tools and is very well accepted by the users. The reasons for this might be the easy usability and the well-designed user interface. Thus, “Skype Translate” is our choice from the presented software modules.

3.7 Other Options

There are other options, compared to the presented Skype chat translation modules, to provide the capability for cross-lingual chat. In addition to Skype, there exist other software solutions for Chat programs, such as ICQ. For ICQ, there are also several modules for instant chat translation. Furthermore, even social media networks like Facebook include an option to communicate with other users via chat and personal messages. Thereby, an module for automatically translating messages is integrated.

4 Conclusions

In this document, several software modules for cross-lingual chat support are presented. The application of a translation module within the ALIAS system is a perfect way to pursue the goals of the project. Compared to a conventional telephone call, using a chat module for communication has several advantages. Since the messages are in a written form, the chat history can easily be saved and accessed, which is especially useful for elderly people with light dementia. Furthermore, a module for text translation can be integrated into such a chatting tool. Thereby, users can communicate with other people in foreign languages. We presented several available solutions for translation modules, all of which having their advantages and disadvantages. One important feature of such a module is the number of available languages. The software “Skype Translate” supports 51 languages. On the other hand, a software called “CTSS – Chat Translator and Speaker for Skype” provides several other features, e.g., to read out received chat messages. With such a chatting module, elderly people living alone at their homes have the possibility to stay in contact with relatives and friends. Furthermore, it is even possible to make new friends who share the same interests. In this way, one of the main goals of the ALIAS project, social inclusion, is fulfilled.