



LANGUAGE TECHNOLOGY

What is Language Technology?

Language Technology is all about getting computers to do useful things with human language, whether in spoken or written form. It's a key technology that will drive advances in computing in the next decade. Imagine being able to talk to your car and have it respond intelligently, giving detailed advice on routes or summarising up-to-date news you just missed on the radio. Or, being able to speak or type queries to your Web search engine in ordinary language, just as you would ask a person, and have it return just the document you were looking for, perhaps in summarised form for easy reading, translated from another language and with the key points for your purposes highlighted. Or imagine having an intelligent agent in your electronic mailbox that scans incoming mail for requests for lunch appointments and books your favourite restaurant automatically. Some of these capabilities are already here, and others are on the horizon. By studying Language Technology, you'll acquire the skills needed to develop applications like these.

LT at Macquarie

The Language Technology Program is made up of a set of units that you can take as part of a degree in Computing (see 'Core units'). You don't have to take all the units: you could start with SLP148 to get an idea of how exciting this field can be, then focus on either the spoken language strand (COMP248 and COMP349) or the web and document strand (COMP249 and COMP348).

We also run specialised honours units each year. The LT units benefit from our close contacts with industry, so you'll always be assured of career-relevant content. See <http://www.clt.mq.edu.au/Teaching> for more information.

Applications of Language Technology

Language Technology builds on 40 years of research in natural language processing and artificial intelligence to support applications like the following.

Spoken Language Dialog Systems

These systems enable you to talk to a computer via a telephone in order to enact some transaction or information-seeking task. For example, you might call up on the phone and talk to a machine in order to buy or sell stocks and shares, or to get route directions from one city to another.

Question Answering Systems

Search engines are ready to get more intelligent. Web-based systems can use natural language processing techniques to better understand what information you're looking for, and natural language generation can provide more carefully crafted answers.

Machine Translation

Machine translation technology takes a document in one language and translates it into a document in another language. Surf the Web and read pages written in languages you don't understand! It's also possible to develop applications that can translate spoken language.

Text Summarisation

Summarisation technology produces shortened versions of longer documents for those situations where you don't have the time to read the whole thing: an essential tool for dealing with information overload. Linked with smart technologies like optical character recognition, the photocopier that reduces a 10 page document to a 1 page document is not far away!

Careers

In the last 10 years, research in this area has left the laboratory and has begun to make a significant commercial impact. Industry activity is intense at both ends of the spectrum: many new companies are centered on this technology, and almost every major international IT company is pursuing developments in the area. Employers are hungry for candidates with the necessary skills for software design and development in this area. Be amongst the first to graduate in Australia in this exciting and fascinating new area!

Core units

SLP148: Language, Logic and Computation

Are you a tireless philosophical thinker? Do you love the study of language for its own sake? Are you fascinated by the practical possibilities offered by the use of language by computers? Get to grips with the multidisciplinary nature of the study of language in this introductory unit, which lays the foundations for the study of human language processing by machines.

COMP248: Language Technology

Most people still interact with computers using a keyboard and a mouse; but a more natural form of interaction is to use the language you use every day. In this unit, you learn what's involved in building a chatterbot, a program that can have a conversation with you via the keyboard, and a spoken language dialogue system that can take your pizza orders using voice recognition.

COMP249: Web Technology

If you've ever wanted to play a role in shaping the World Wide Web then this unit should be part of your program. Find out how the web works, from the way that requests are passed between browser and server to the technology behind online business and search engines. What will the web look like in five year's time? Want to help take it there?

COMP348: Document Processing and the Semantic Web

Our world is full of digital text, but how do we make our computers understand it? How does a search engine find the best result when you give it just a few words? This unit is about building technologies that make the most of documents on the web and elsewhere, including the Semantic Web, which is set to provide the basis for a whole new generation of software technologies.

COMP349: Spoken Language Dialogue Systems

This unit explores issues involved in creating telephony-based spoken language dialogue systems: systems that bring the power of the web to the telephone. You'll gain the industry-relevant experience you need to develop practical speech applications, understand industry standards such as VoiceXML and SALT, and learn basic strategies for designing user-friendly speech interfaces.

Industry Partners

The units in the LT Program are taught by staff from the Centre for Language Technology: this is Australasia's largest and longest-established body of researchers working in natural language processing, computational linguistics and language technology, so you can be assured that what you learn takes account of the latest research breakthroughs. If you stay on for honours and beyond, you also have the opportunity to pursue research in LT with leading international researchers.

Find out more about the CLT at:
<http://www.clt.mq.edu.au>.

Teaching Faculty

Members of staff teach in their specialist areas; in some units, occasional guest lectures are also given by speakers from industry.

Professor Robert Dale:

Natural language generation, spoken language dialog systems, information extraction.

Dr Steve Cassidy:

Linguistic annotation, speech recognition, XML, databases.

Dr Mark Dras:

Formal syntax, natural language parsing, machine translation.

Dr Diego Mollá Aliod:

Question answering systems, answer extraction, formal semantics.

Dr Rolf Schwitter:

Controlled languages, question answering systems, logic programming.

Further Information

For further information on the Language Technology Program at Macquarie University, email ltinfo@ics.mq.edu.au, or call Professor Robert Dale on 02 9850 6331.
Or check out our Web site at <http://www.clt.mq.edu.au/Teaching>.

Language Technology is widely recognised as a critical technology for the 21st century ... be part of it!



Centre for Language Technology
Department of Computing
Macquarie University
Sydney • Australia

Language Technology