LT 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 summarized 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.

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!

How Do I Take Part?

The Language Technology Program is a set of units that you can take as part of a degree in Computing. You don't have to take all the units, and you're also encouraged to take related units in Linguistics and Philosophy: see the web site at http://www.clt.mq.edu.au/Teaching for more information.

The content of the Language Technology units is designed in consultation with the program's Management Advisory Board, which carries representation from a number of industry partners. That means that students undertaking the program can be sure they are acquiring the skills that will position them well for jobs in this exciting industry.

Core units

COMP248: Introduction to Natural Language Processing
Learn how chatterbots work. Speak to your computer and learn how to get it to understand what you say, and to do what you want. This unit gives you all the basic material you need to understand what's involved in building natural language processing systems, and prepares you for the more specialized advanced units we offer at 300-level.

COMP249: Web Technology
How does the web *really* work? This unit reveals what's under the bonnet. Learn about server side and client side technologies, find out what's important in Web design, and understand how XML and its related technologies are bringing smarter processing to the web. This unit gives you a picture of the cutting edge of the wired - and wireless - world.

COMP348: Intelligent Text Processing
Ever been frustrated by a search engine? Find out how they work, but more importantly, find out how to make them intelligent. This unit also covers sophisticated web-based language technologies like document summarization, information extraction and machine translation. If you want to know about the Semantic Web, this is the unit for you.

COMP349: Interactive Dialog Systems
Building on what you learned in Comp248, this unit shows you how to build complex and sophisticated question answering systems, both for use on smart web sites and for voice access. Learn about key speech system skills like dialog design and grammar writing. The unit uses the industry standard VoiceXML, so it sets you up well for jobs in the voice recognition industry.

Industry Partners

The program is generously supported by the following organisations:

- **CSIRO Intelligent Interactive Technologies**

- **Motorola Australia Pty Ltd**

- **Philips Speech Processing Systems Pty Ltd**

- **Sun Microsystems Australia Pty Ltd**

- **Appen Pty Ltd**

Among other contributions, these sponsors have made available a number of honours scholarships that will enable top-performing students to undertake projects with industry in their final year.

We expect that additional industry partners will join the consortium as the program develops.

Faculty

Macquarie's staff in the Department of Computing bring specialist expertise and knowledge to the teaching of the material in the program:

Associate 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 Associate 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!

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