University of Tasmania  
School of Computing  
KXA457 Machine Learning and Data Mining  
Unit Outline  
Semester 2, 2003

Prerequisites  
None  
Corequisites  
None  
Unit Weight  
12.5

Unit Coordinator  
Dr. Mike Cameron-Jones  
Room V171  
(03) 6324 3395  
Michael.CameronJones@utas.edu.au

Scheduled Teaching Sessions  
Campuses:  
- Launceston  
- Hobart  
Lectures: (See below)  
Tutorials: (See below)

The Unit Timetable can be accessed from the Study Resources section of the School website.  

There will be 2 or 3 hours of lecture/tutorial per week depending upon week. Teaching sessions will be delivered simultaneously to both campuses via video-conferencing.

Unit Website  
The unit website is accessed from http://webct.utas.edu.au:8900. You will need to use your email pop account username and password to log on to the WebCT system. Once authenticated by the system your personalised MyWebCT area will be displayed. It contains links to the websites that you have permission to access - including the website for this unit.

This unit is Web Supplemented. This means that the use of the Web is optional for this unit. The unit website contains unit information and resources.

If you are not able to access the unit website, please contact the University IT help desk:

- Level 2 Morris Miller Library, Sandy Bay Campus; Level 0 Building A, Newnham Campus.  
- Website: http://www.utas.edu.au/helpdesk  
- Telephone: 6226 1818  
- Fax: 6226 7669  
- Email: HelpDesk@utas.edu.au

Prescribed Text  

Papers from the research literature will be prescribed during the unit.

Provider  
School of Computing - Faculty of Science, Engineering, and Technology.  
http://www.comp.utas.edu.au

Useful University Web Links  
Information and Resources for 'Current Students' are available on the university website at:  
http://www.utas.edu.au/students/  
It includes useful links such as:


OVERVIEW  
Introduction  
Machine Learning is commonly considered to be a sub-field of Artificial Intelligence, and can be seen as the study of computational approaches to finding patterns in data. Data Mining applies Machine Learning
techniques to look for patterns in large data sets. This unit introduces the key current ideas and techniques in Machine Learning.

Students entering the unit will be assumed to have a knowledge of algorithms, and of programming in Java, as covered in the BComp core.

Objectives
On successful completion of this unit, you will be able to:

- Understand the key current ideas and techniques in machine learning sufficiently to apply them to practical (data mining) problems and participate in research in the area.

Unit Content
Classifier Learning:
1. Decision Trees
2. Rule Sets
3. Naive Bayes
4. Instance Based Learning
5. Neural Networks
6. Combining Multiple Classifiers

Other Topics:
1. Numeric Prediction
2. Inductive Logic Programming
3. WEKA
4. Applications

For more information see the section titled 'Content' on the unit website.

Generic Skills
The university has defined a set of generic graduate attributes expected in its graduates. http://www.admin.utas.edu.au/academic/acservices/meetings/Senate/Appendix/3_01D1.doc Your course is designed to enable you to develop generic skills that are valued in, and expected of, graduates. These are skills that you will need to develop over time. Hence you are encouraged to look for opportunities, as you study each unit, to reflect on and improve these skills.

LEARNING AND TEACHING
Approach to Learning
You are expected to spend about 130 hrs studying in this unit - this includes attendance at scheduled teaching sessions. (For a 13 week semester this is, on average, 10 hr/wk.) This is the amount of study time that the 'typical' student will need to reach the level of competence and understanding required to fulfil the unit objectives.

You are expected to:

- attend all scheduled lectures and tutorials, unless otherwise notified by the unit coordinator
- prepare for, and actively participate in lectures and tutorials
- complete the assigned learning tasks
- review what has been learnt
- complete assessment items and submit them on time
- access and be familiar with the information and resources available on the unit website
- seek help from teaching staff if you have any questions or difficulties in studying this unit

You are encouraged to read the university's Code of Conduct for Teaching and Learning. Part A describes the 'Responsibility of the University to Students' and part B describes the 'Responsibilities of Students to the University'. http://www.admin.utas.edu.au/HANDBOOKS/UTASHANDBOOKS/RULES/CTEA.html

Schedule
See the 'Schedule' section on the unit website for the timetable and associated resources.

Teaching and Support Staff
Teaching Staff

Unit Coordinator:
Lecturer: Dr. Mike Cameron-Jones
E-Mail: Michael.CameronJones@utas.edu.au
Phone: (03) 6324 3395
Room: V171

Lecturing Staff
No Lectures Scheduled
School Help Desk

Contact the School Help Desk if you have any queries or problems with accessing, using, or printing from the computers in the School of Computing labs.

- **Hobart**: the Help Desk is located near the School's reception desk and is open in the morning from 9-11, and in the afternoon from 12-1 and 2-4, Monday-Friday. The phone number is 6226 2960.
- **Launceston**: the Help Desk is located near the entrance to the computing labs and is open in the morning from 10-12, and in the afternoon from 2-4:30, Monday-Thursday. On Fridays it is open from 10-12 in the morning and 2-4 in the afternoon. The phone number is 6324 3654.
- **Burnie**: the computer labs at the NWC are maintained by ITS. Please contact the University Help Desk for assistance. The 6 Macs are maintained by the School of Computing. If you have a query or problem that is specific to the School of Computing please phone the School of Computing Help Desk in Launceston.

University Services and Support

The University has staff available to assist you, such as the:

- Learning Development Advisor
- Student Counselor
- Careers Advisor
- Disability Officer

For more information and contact details see the Services and Support section on the University 'Current Students' web page, [http://www.utas.edu.au/students/](http://www.utas.edu.au/students/)

Resources

Unit Website

The unit website contains unit information and resources.

Prescribed Text


Papers from the research literature will be prescribed during the unit.

Software

The software that you will need to access the unit website and to study this unit, including general purpose software such as word processors, is provided on the computers in the School's computing labs. If you intend to use software on other computers please check that the versions are compatible.

The unit will use the WEKA suite of machine learning programs (in Java).

Computing Facilities

The School has PC labs (Windows 2000 Professional), Mac labs (Mac OS-X 10.2), Unix labs (linux / X-windows), and Networking labs at the Newnham and Sandy Bay campuses. It also maintains 6 Macs (Mac OS-X 10.2) at the NW Centre.

If you have not used these facilities before please contact the School Help Desk to organise you account details. If you would like to access the facilities at the Newnham and Sandy Bay campuses after hours please contact the School Help Desk.

Please contact the School Help Desk if you have difficulty accessing or using these facilities.

Ethical Use of Facilities

Use of computing facilities provided by the School is subject to the School's Ethics Guidelines - [http://www.comp.utas.edu.au/app/ethics.jsp](http://www.comp.utas.edu.au/app/ethics.jsp). Copies of the guidelines are also available in all School labs. The School's facilities may only be used for study-related purposes, and may not be used for personal gain. The playing of games is strictly prohibited in all labs at all times. Before being granted access to the School's facilities, you will be required to sign a declaration that you have read and understand these guidelines, and that you will abide by them. Disciplinary action may be taken against students who violate the guidelines.
The university is committed to providing a safe and secure teaching and learning environment. For more information see http://www.admin.utas.edu.au/hr/ohs/pol_proc/ohs.pdf

ASSESSMENT

Assessment Items

Item 1

Title: Paper Presentation and Discussion
Type: In-Semester - individual assignment
Weighting: 20%
Due: During semester

Students will present and discuss prescribed papers from the research literature. The dates of the presentations, and the allocation of papers to students, will be specified during the unit.

Students will be marked on their own presentation and on their contribution to the discussions of all presentations. (Missing a presentation will result in loss of marks.)

It is expected that these marks will be influenced by peer assessment.

Item 2

Title: Assignment
Type: In-Semester - individual assignment
Weighting: 20%
Due: 17:00 13th October

The assignment will involve implementing or modifying some machine learning programs, experimenting with them and others, and writing a small paper reporting the results obtained.

Item 3

Title: 2 hr Examination
Type: Formal Examination
Weighting: 60%
Due: University Examination Period

See the 'Assessment' section in unit website for more detailed information about assessment items.

In-Semester Assessment

Unless specifically stated in the specification of the assessment item provided on the unit website, it is required that:

- work submitted by a student is the work of that student alone OR
- where the assessment item is to be completed by a group of students, the work submitted by the group of students is the work of that group of students alone.

Plagiarism

Plagiarism is taking and using someone else's thoughts, writings, or inventions and representing them as your own; for example downloading an essay from a cheat site, copying another student's work, or using an author's words or ideas without citing the source. Plagiarism is a form of cheating. It is a University offence punishable by a range of penalties including a fine or deduction/cancellation of marks and, in the most serious of cases, exclusion from a unit, a course, or the University. When in doubt consult your lecturer or tutor. Details of penalties that can be imposed are available in the Ordinance of Student Discipline or at http://www.utas.edu.au/plagiarism.

Referencing

The university document on plagiarism contains information about referencing the work or ideas of others. The preferred text referencing systems for the School is the Harvard system (also referred to as the author-date system). For information on the Harvard system see http://www.utas.edu.au/library/assist/gpoa/gpoa2.html.

Submissions

All in-semester assignment submissions (including electronic submissions) are to include an Assignment Cover Sheet which includes a statement confirming that the submission is your own work. If this
undertaking is not signed, the assignment will not be marked. The Assignment Cover Sheet is available from the School Help Desk in Launceston and Hobart, and on the School's web site http://www.comp.utas.edu.au/app/studyresources.jsp.

**Extensions**

Assessment items will not be accepted after the due date except under the conditions stated in the school policy on late assessment, http://www.comp.utas.edu.au/app/late_assess.jsp

**Formal Examination**

The formal examination is conducted by the University Registrar. The 'Current Students' section on the university website contains information about the conduct of, and timetable for, formal examinations.

**Final Grade**

Overall assessment will be based on the student's performance throughout the semester as well as in a formal examination. In order to achieve a pass (or better) result, a student must obtain:

1. at least 40% of the total mark for in-semester assessment items
2. at least 40% of the mark for the formal examination
3. at least 50% of the overall mark

Passing grades will be awarded based on the AVCC guidelines:

- PP at least 50% of the overall mark but less than 60%
- CR at least 60% of the overall mark but less than 70%
- DN at least 70% of the overall mark but less than 80%
- HD at least 80% of the overall mark

The maximum mark awarded to a student who fails the unit will be 44.

For more information, including other grades such as Supplementary and Terminating grades, see the School of Computing's guidelines for assessment - available at: http://www.comp.utas.edu.au/app/assess.jsp