Supercomputer research

A team of researchers from the Department of Computer Science at the University is completing designs for a supercomputer which will have a memory 40 times the capacity of present supercomputers.

The team of six is led by the Head of the Department, Dr John Rosenberg, who says that if the prototype is successful the new computer should be marketable within the next five years.

A team at the University of Bremen in West Germany, led by Professor Les Keedy, former head of Newcastle's Department of Computer Science, is assisting with the development of software for the new computer, to be known as the MONADS MM.

The supercomputer's memory capabilities should help resolve a range of problems that are out of reach for current computers and permit a variety of scientific computations not attempted as yet because of the limitations of present-day machines.

Supercomputers are a kind of machine capable of carrying out quick computations and analyses such as are needed for accurate weather forecasts, vital predictions for flights by NASA space shuttles and the development of models for phenomena such as the greenhouse effect.

Because of the complicated electronics in them they cost between $10 million and $20 million each.

What they are capable of achieving is limited by the amount of information they are capable of carrying. This is called main memory.

In today's most sophisticated machines the maximum amount of main memory available is about 100 million bytes, which means that the amount of information they can easily access is held in 100 million characters.

What Dr Rosenberg and his team are developing is a computer with a main memory of 4,000 million bytes.

Dr Rosenberg said that the new computer would never entirely take the place of present supercomputers. But because it did not require large amounts of complicated electronics, it would cost only about $400,000 and be more compact, about the size of a domestic refrigerator.

The Newcastle team is the only group of researchers in the world developing a massive-memory supercomputer.

Dr Rosenberg spent 10 years in background research on the MONADS project at Monash University, Melbourne and the University of Newcastle in order to build the type of computer which could handle a massive memory.
Investigation into electrical activity of the brain

A degree of Doctor of Philosophy in the Department of Psychology will be awarded to Mr Barry Frost for his studies of brain activity.

The work contained in his thesis 'Slow potential correlates of information processing in complex stimulus paradigms' forms part of a continuing investigation into brain electrical correlates of information processing and anomalous brain activity.

Mr Frost's supervisors were Assoc. Professor B. Fenelon, until his retirement, and Dr M. Hunter. Assoc. Professor Fenelon was a pioneer in the area that Mr Frost studied.

Task relevant information

Mr Frost has continued to work towards the explanation of specific characteristics of cerebral dysfunction that would assist in the development of more appropriate rehabilitation techniques for the clinically disabled.

The major finding of the research project was that there are certain slow electrical potentials, such as the E-wave, that are generated in the brain by the anticipation of task relevant information.

Hitherto, the paradigms used to investigate such potentials have led to the conclusion that these responses, if they existed, were so small as to be insignificant.

Employing a number of innovative and complex paradigms the research demonstrated that the converse, does in fact, appear to be the case.

The E-wave can be readily elicited, is of substantial amplitude and is contingent on the relevance of anticipated information. The reliability and potential of the E-wave in the investigation and diagnosis of reading problems was also demonstrated.

In order to investigate the significance of the more sophisticated paradigms employing complex stimulus arrangements with varying temporal relationships, Mr Frost employed a number of computer systems.

The software for these systems was written by Dr R.A. Neill, a physicist who was working in the department as a Research Officer.

Dr Neill's expertise was invaluable in the development of both stimulus generation techniques and in the detailed analysis and measurement of specific slow potential components.

Brain compensating mechanisms

Several articles arising from this research have been published, two are under revision and others are in preparation.

Further work is planned and will address theoretical and applied issues, particularly as they pertain to the learning disabled and schizophrenic disorders.

In particular, Mr Frost hopes to investigate methods of assessment of brain compensating mechanisms following cognitive rehabilitation and restructuring.

Presently, Mr Frost is employed as a Neuropsychologist with the Hunter Hospital, but through his research interests maintains strong links with the Human Brain Research Laboratory at the Department of Psychology.

Thai visitors to the Medical School

A delegation from the Faculty of Medicine at Madidol University in Thailand recently visited the Faculty of Medicine at the University.

The Vice-Chancellor, Professor K. Morgan, hosted a lunch in the Staff House. Pictured (from left) are: Dr Viriyavejakul, Professor Kellerman, Dr Vanadurongwan, Professor Morgan, Professor Rukspoilmuang and Professor Hamilton.
Physics Department study in Antarctica

The University of Newcastle's Department of Physics, under Assoc. Professor Brian Fraser, is studying space plasma waves which directly enter the upper atmosphere above Antarctica from solar wind.

His Department has collaborated with the Australian Antarctic Division in Hobart and the New Zealand DSIR Antarctic Division in Christchurch to set up a network of recording stations to undertake continuous observations of the waves.

The stations have been established at Macquarie Island in the Sub-Antarctic and Mawson, Davis and Casey on the Antarctic continent. A fifth station is being established at New Zealand's Scott Base on Ross Island.

The Space Plasma Wave Research Group in the Department of Physics is installing a network of induction magnetometers to study the generation and propagation of hydromagnetic and ion cyclotron waves (space plasma waves), which directly enter low altitudes in the high latitude southern polar cusp region at 70-80° geomagnetic south from the solar wind.

Professor Fraser, recently returned from a very quick visit to Antarctica. He was away for 16 days in January and spent 13 of these on Ross Island, adjacent to the Ross Ice Shelf in McMurdo Sound.

The trip was made in eight hours from Christchurch to the McMurdo Sound ice runway by a ski-equipped C130 Hercules, of the US Navy Antarctic support squadron.

Describing his stay at Scott Base, Professor Fraser said: The weather at Scott Base was variable. Although the sun shone for 24 hours a day, it dipped to an elevation of about 9° near midnight.

The maximum daytime temperature experienced was +0.5°C, while the minimum was around -15°C. It was often on these latter days that work in the field had to be undertaken and the full Antarctic kit provided by the New Zealanders was really appreciated'.

The scientific work at Newcastle is presently being carried out by Dr Hedley Hansen, Dr Fred Menk, a Lecturer in Physics, and Professor Fraser.

Dr Hansen, a Research Associate sponsored by the Australian Research Council and the Antarctic Science Advisory Committee, joined the group in June, 1988, after graduating from the University of Natal.

Mr Mike Craven, a University of Newcastle research student on the project, who is presently employed by the Australian Antarctic Division, is on his way back from Antarctica after having spent 1988 wintering over at Davis and recording data for his thesis work.

The establishment of the station at Scott Base was made possible by the acceptance of a proposal from the Space Plasma Wave Research Group by the New Zealand Ross Dependency Research Committee and the New Zealand DSIR Antarctic Division which provided logistical support. Partial funding was also approved by the University of Newcastle Research Committee.

In the past, upper atmosphere experiments by New Zealand, USA and USSR scientists have been carried out at Australian Antarctica bases and this reciprocal arrangement is a further example of the co-operative nature of Antarctic research.
University attracts the best overseas students

Mrs Marcia Boêchat Fernandes, from Brazil, typifies the highly qualified overseas students who are attracted to the University of Newcastle by its reputation as a research institution.

The total number of applications for research scholarships at the University has steadily increased in the last few years.

Mrs Fernandes, who was awarded a University scholarship to study for a PhD degree in linguistics and is completing her final year of work, was recently invited to present one of her research papers in the United States.

Achieve oral fluency

Her destination was TESOL '89 — the 23rd annual convention of Teachers of English to Speakers of Other Languages — held in San Antonio, Texas.

TESOL is the foremost international conference for researchers in Mrs Fernandes' area of interest and according to the staff of the University scholarships for PhD students are available to students who are completing their final year of work.

The objective of my paper, 'Teacher Decision-Making in Student-Centred Communicative Language Teaching', is to present a process plan of student-centered procedures which may better enable foreign language students to achieve interactive oral fluency.

The teacher's decision-making focuses on an error analysis and feedback alternative — a breakthrough to facilitate students' storage retrieval and spontaneous use of language,' she says.

From Texas, Mrs Fernandes went to Honolulu to present and discuss her work in the Department of English as a Second Language at the University of Hawaii. This department is currently one of the leading centres in the area of second language teaching. 'Not only did I present and discuss my work, but I am also reporting back with the latest news and developments in the TESOL field.'

Marcia said she also enjoyed her visit, 'I lived in Honolulu for a year when I was 12, so it was nice to return to the scene of many wonderful memories and be able to play-back a nostalgic period in my life.'

Mrs Fernandes recently participated in the AILA 8th World Congress of Applied Linguistics in Sydney and the 16th IFILV World Congress on Language Learning in Canberra.

A valuable contribution

She has leave of absence from her University in Brazil — Universidade Federal de Uberlândia — to which she is attached as a senior lecturer.

She came to Newcastle with a distinguished record, having won a gold medal and a Diploma of University Merit as the outstanding graduate of the Letters Course.

In the Linguistics Department, she has done a lot of research on perspectives in student-centered communicative language teaching and has devised a process plan which has generated considerable interest and favourable comment from several eminent international scholars. Her thesis will make a valuable contribution to the field of foreign and second language teaching and learning.

COMPUTER SEMINAR SERIES

TUNRA, in conjunction with the University's Department of Management and Computer Centre, offers you the following series of Computer Seminars in 1989.

- May 1: Basic Introduction to Micro Computers, $250.
- June 5: Introduction to Lotus (version 2), $250.
- June 26/29: Microsoft Word (version 3, four evenings), $350.
- July 3: Introduction to D Base 3, $250.

Advanced courses in Lotus and D Base will be held in September and October. Other courses can be arranged on request: e.g. expert systems and project management with micro computers. In-house computer training can also be arranged for a broad range of topics and skill levels.

The University of Newcastle NSW. 2308 AUSTRALIA Phone: (049) 67 1811 Fax: (049) 674946 Telex: AA 28764

THE UNIVERSITY OF NEWCASTLE RESEARCH ASSOCIATES LTD.

Seminar details — Gary Pullen at 67 1811.
Report on Maori land claims

Professor Alan Ward, Professor of History at the University of Newcastle, is a consultant to the Waitangi Tribunal, which New Zealand has set up to improve its race relations.

Professor Ward is assessing some of the evidence on Maori land claims and writing a report for the Tribunal.

He writes:

The operations of the Waitangi Tribunal in New Zealand since 1985 has involved New Zealand historians.

Before declaring New Zealand a British possession, at first included within the boundaries of New South Wales. Lt. Governor Hobson, in February 1840, enacted a treaty with Maori chiefs at the village of Waitangi in the Bay of Islands.

The treaty was in both English and Maori and was subsequently taken around the country for the approval of the chiefs in most districts.

Claims against the Crown

In return for accepting the sovereignty of Queen Victoria the Maoris were promised the rights and privileges of British subjects and protection in their lands, forest, fisheries and 'raonga' (precious things). They were also promised that they would be confirmed in their 'tino rangatiratanga' — a phrase which has been variously translated as 'chiefship' and 'self-determination'.

For more than a century the Treaty had little standing in New Zealand domestic law but in 1975 the Treaty of Waitangi Act established a Tribunal before which Maori individuals or groups could bring claims against the Crown for breaches of the treaty.

In 1985 an amendment act gave the Tribunal jurisdiction to hear claims retrospectively to 1840.

This unleashed a flood of claims, which threatened to make the whole process unworkable.

The Chief Judge of the Tribunal, Judge Eddie Durie, himself a Maori, has sought to aggregate the claims on a tribal basis; the first large tribal claim to come before the Tribunal is that of the Ngai Tahu people of the South Island.

Because the claims date back to 1840, and indeed consider the Maori people's relationships with Europeans before 1840, the evidence is overwhelmingly historical.

The claimants sometimes have qualified historians among them, or employ staff of university history departments to help them research the documents and prepare their submissions. The Crown responds, employing its own experts.

The Tribunal itself has some historians, university professors, in its membership, but also employs historical consultants to help assess and interpret the claims and counter-claims.

The whole process is very searching and very professional and New Zealand's archives are being turned over as never before.

The stakes are very big. Maori claims to tidal shores and reefs, to inland and offshore fisheries, affect a $600 million industry; land claims touch on large areas.

It becomes of crucial importance, for example, to know the nature of a transaction between Maori chiefs and French whaling captains in 1838, off Banks Peninsula, and whether the British were entitled, on taking sovereignty to regard the Maori title as already extinguished.

The terms of deeds, the old maps accompanying them, the nuances of meaning in English and Maori language deeds, and varying cultural perceptions of how these things might have been understood at the time, are minutely studied.

Reasonable remedies negotiated

When questions of fact and historical interpretation have been clarified as exhaustively as possible, the Tribunal will be in a position to determine whether, or in what ways, the principles of the treaty have been breached, and recommend appropriate action to the government.

The whole endeavour is New Zealand's attempt to put its race relations on a healthy footing by providing a due process by which grievances can be aired, wrongs acknowledged, and reasonable remedies negotiated where appropriate.

New Zealanders, Maori and non-Maori, are together interpreting their own historical experiences and the professional historians are assisting in the process.
Medical unit beats world competition

Two videotapes produced by the University of Newcastle's Medical Communications Unit have won awards in the Occupational Health & Safety category of the 1988 Australian Training Film and Video Awards against competition from the United Kingdom, Europe and the United States.

The programs were part of a series of four videotapes produced for HOSPLAN, the Planning Division of the New South Wales Department of Health. The videotapes were shown to an audience of delegates from all over the world at the inaugural World Congress of Environmental Health, receiving widespread acclaim.

The Director of the Medical Communications Unit, Mr. Adrian Daniel, explained that HOSPLAN had approached the Unit in 1986 with the idea of producing a series of videotapes on fire safety in hospitals. A concept submission was put to HOSPLAN by the unit to script and produce the four programs over a period of two years. Mr. Greg Dunford was contracted to produce as well as appear in each program.

The Chairman and Convenor of the judging panel, Mr. D. Douglas, in a letter to HOSPLAN commented: 'The package which you entered included two videotapes "First Aid Fire Appliances" and "Fire Emergency and Evacuation Procedures". The judging panel which comprised representatives of Worksafe, The World Environmental Health Congress Committee and professionals engaged in education, training and occupational health and safety were unanimous in considering the package the most appropriate to current occupational health and safety needs in New South Wales.'

Mr. Douglas continued: 'Its strengths include a comprehensive coverage of the content required, highly effective planning and filming of a number of demonstrations and the skillful use of positive reinforcement throughout.'

Mr. Daniel explained that the emphasis on effective planning and filming as well as on positive reinforcement of key messages in both programs was a direct result of the Unit's policy of ensuring that educational videotapes are well-planned, and entertaining and effectively present the information required.

He further commented that the awards for the two programs reflected the professional expertise of production staff in the Unit. The fact that the unit is receiving requests for production from a wide range of clients is indicative of the high quality of programs being produced by the Medical Communications Unit.

Praise for University campus

Two Professors of Biochemistry, one from Brazil, and one from Canada, were struck by the beauty of the University grounds when they made short sabbatical visits.

Professor James Gurd, of the University of Toronto, Canada, and Professor Richard Rodnight, of the Federal University of Rio Grande do Sul, Porto Alegre, Brazil, exchanged ideas and worked with Dr. John Rostas, Assoc. Professor Peter Dunkley and their colleagues in the Neuroscience Group in the Faculty of Medicine.

Professors Gurd and Rodnight described the Newcastle University campus, with its trees, as "very attractive — certainly superior to the others we've seen in Australia — and very conducive to the pursuit of study and research'.
Donations reach $100,000 in building appeal

Donations to the 2NUR Building Appeal, to build new studios for the radio station, have reached $100,000 — 20 per cent of the target.

In making this announcement the Chairman of the Board of Directors of 2NUR, Professor Cyril Renwick, thanked all those who had responded to the appeal.

He said the response to the appeal since its launch last November was very pleasing.

He was particularly grateful for large donations from:

- Newcastle City Council, $20,000;
- The Hunter District Water Board, $10,000;
- Broadcasting Investments Pty. Ltd., $10,000;
- The Commonwealth Bank, $5,000;
- Shortland Electricity, $5,000;
- The Maritime Services Board, $5,000;
- Westpac, $5,000.

Prominent spot on campus

Professor Renwick said that, ironically, the success of the station had contributed to the urgent need for new premises. Although the budget and paid staff were small, he said, the station boasted a volunteer staff of more than 100 people.

The current premises at the top of the Mathematics Building at the University were cramped and inconveniently sited as far as aged and handicapped volunteers were concerned. In any case, the current rooms — borrowed from the Mathematics Department in 1978 — were needed by the University for teaching space.

Plans had been completed for a modest, but striking, two-storey building to house 2NUR, to be built in a prominent spot on the University campus.

2NUR had established a solid record community service since it was established in 1978, according to Professor Renwick. The station had a reputation as one of the best public broadcasters in Australia, collecting numerous industry awards.

He said that 2NUR — the Hunter Region’s only public radio station — brought together the resources of the University and the community to provide a uniquely valuable service.

An artist’s impression of the proposed new 2NUR studios

Professor Renwick said the new University of Newcastle Act would provide for the University to have particular regard of the needs of the Hunter Region, the Central Coast and surrounding areas and provide cultural, professional, technical and vocational services to the community. This meant that the role of 2NUR would become significantly more important to the University and the community in the future.

In a letter to taxpayers in the Hunter Region, Professor Renwick asked them to think constructively about tax deductibility and the options it gave for regional stimulus.

He said people often didn’t realise that they had some control over local investment, because of tax concessions granted by the Federal Government.

The 2NUR Building Appeal was an opportunity for local taxpayers to take advantage of tax concessions and to support education in their own region.

Professor Renwick’s estimate of the amount that could be held back by the Hunter Region using tax deductibility, calculated on Reserve Bank figures, was at least $250 million a year.

2NUR Director, Mrs Iris Nichols, has set a target of $100,000 for donations from community sources.

Mrs Nichols is in touch with many organisations and already the response to her personal appeal has reached $15,000.
Old heads vs new in essay writing

Ms Stephanie Jean Moylan compared the essay writing of mature age students and students entering university straight from school in her thesis for the award of a Master of Education degree.

She writes: 'In carrying out this project, I was particularly interested in examining the differences in approaches to learning and learning style in essay writing between mature age students and students entering university straight from school and the difficulties these students have with essay writing.

The mature age students were enrolled in the Open Foundation Course at the University and students entering university straight from school were first year Arts students who had just completed the Higher School Certificate in the previous year.

The findings of the study reveal that the two groups of students were not significantly different in their approaches to learning, though the mature age students were relatively more likely to have intrinsic and achieving motives for study and less likely to have pragmatic motives for study.

There were also no major differences between the two groups in the strategic style in essay writing employed by the more reflective writers. Among those who employed reflective writing strategies, students entering university straight from school considered their intentions carefully and engaged in extensive planning prior to writing, whereas mature age students engaged in reflection and intensive revision during writing.

With regard to difficulties with essay writing, mature age students reported difficulties expressing their thoughts in writing and overcoming their anxiety due to lack of experience with essay writing.

The major difficulties for students entering university straight from school were lack of motivation, and adjusting to the greater essay length required and the limited assistance available at university in comparison with school.

'Some students from both groups also reported difficulties with grammar, spelling, interpretation of the essay topic, research and planning,' Ms Moylan said.

Ms Moylan graduated, BSc with Honours in Psychology at the University of New South Wales in 1983.

New staff members benefit from one-day orientation workshop

The University of Newcastle inaugurated one-day orientation workshops for new members of the academic staff to communicate information about the University and its services.

The aim is to assist new arrivals to make a smooth transition to university life.

The Deputy Vice-Chancellor (Academic), Professor Michael Carter, emphasised that moves towards performance indicators and accountability must be accompanied by staff development programs, given appropriate priority and funding.

The workshop was the first step in the direction of a comprehensive staff development strategy.

The Deputy Chairman of Senate, Professor Ron MacDonald, spoke on the academic and administrative structure of the University, emphasising the way in which it interacts with a new academic member of the staff.

He also covered the rights of a member of staff as an academic and the appropriate ways to carry out various aspects of an academic's duties.

The Director of Staff Services, Mr Mike Covill, gave an outline of industrial and personnel matters, including superannuation.

Equal employment opportunity issues were explained by the Co-ordinator of the EEO Unit, Ms Susan Jones.

Dr Allyson Holbrook and Dr Sid Bourke, of the Faculty of Education, spoke on assessing student performance.

Dr Lorna Chan and Dr Phil Moore, also of the Faculty of Education, discussed the important elements in teacher clarity and student learning.

Mr Bede Jordan of Central Audio-Visual Services Unit (CAVSU) concluded the workshop with an overview of the University's audio-visual equipment.