



Cambridge calling

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2008 Australian Mining Technology Conference

Cover Photograph: Rohan Shekhar demonstrating the miniature loading bin facility at CRCMining's Pinjarra Hills site.

CRCMining News

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CRCMining is a multi-million dollar research centre established under the Commonwealth Government's Cooperative Research Centres program. The Centre is supported in its work by 14 industry partners and four leading Australian universities. The Centre's research is spread across five program areas: Shovels, Trucks and Electrical; Coal Production; Smart Mining Systems; Geoengineering and Technology Implementation.

The Centre's purpose is to deliver a continual stream of safety and productivity enhancing technologies to the mining industry and to have these technologies adopted by the industry.



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Introduction

Welcome to the December edition of CRCMining News. On behalf of all of the staff, I would wish everyone a happy and safe Christmas and a more predictable 2009. For those in the middle of longwall moves, happy chocking!

In the next few years, the mining industry ventures into new territory with an uncertain global economic climate, the introduction of a carbon reduction scheme and the unstoppable take up of automation. While I have only been on board at CRCMining for a few short months, I can already see that we have a great deal to offer our members and the broader mining industry in the years to come.

At a time when mining companies would look to reduce their own research and development activities, the team of researchers and experts at CRCMining will assist in maintaining Australia's lead in mining technology. What better time for engineering managers and mine managers to reacquaint themselves with what we do here. I extend an open invitation to come in and look around and see if there are some areas of research or technical problem solving where we can be of assistance. Nowhere in the world will you find a more concentrated, more experienced group of researchers and engineers whose sole focus is solving your technical problems for today and for tomorrow.

All the best for 2009.



Dr Joe Cronin
Program Leader - Coal Production
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CRCMining Program Leaders and Senior Staff rotate in writing this introduction.

CRCMining strengthens research linkages



CRCMining researchers recently co-organised and participated in the 3rd International Symposium on Modern Mining and Technology, held from 4-6 August 2008 in Fuxin, China. The

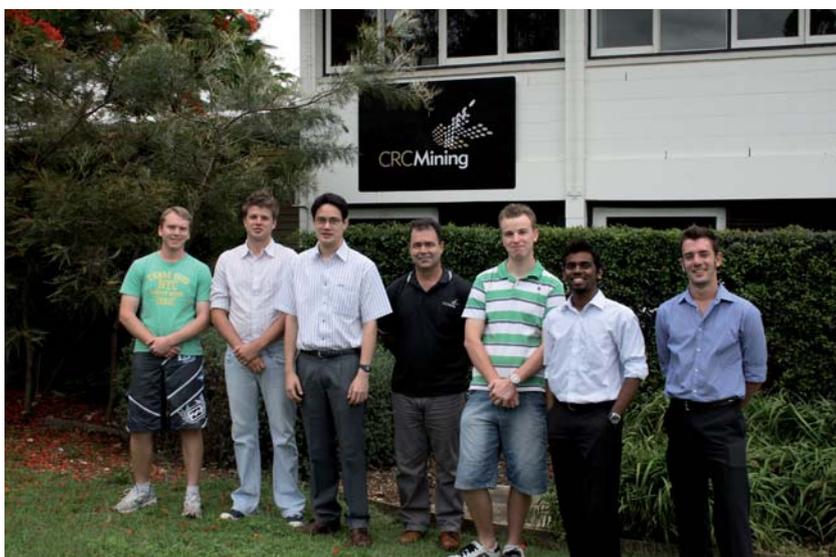
symposium, co-organised with the Liaoning Technical University of China and the Natural Science Foundation of China, attracted more than 350 papers.

CRCMining CEO Professor Mike Hood, Vice President (Business Development) Professor Paul Lever, Dr Zhiqiang Guan and Dr Shuxing Li attended and presented papers at the symposium. During the symposium, Professor Mike Hood held a meeting with the President of Liaoning Technical University, Professor Pan Yishan, to exchange ideas and discuss opportunities for future cooperation. Both sides agreed

to pursue areas of common interest, including project collaboration and international staff / student exchanges.

Established in 1949, Liaoning Technical University is one of China's key universities. It is recognised for its strength in engineering disciplines, particularly in mining engineering, mining equipment and mining safety. It has a current enrolment of more than 30,000 students.

Top Left: Professor Mike Hood, Professor Paul Lever, Dr Zhiqiang Guan and Dr Shuxing Li meeting with Professor Pan Yishan and representatives from Liaoning Technical University



CRCMining's 2008-09 Vacation Students, from left: Lachlan, Tyson, Chris, Nick, Linggesh and Michael. Pictured with CRCMining Research Coordinator Ray Nelson (centre).

Centre welcomes new vacation students

CRCMining has welcomed nine new vacation students for the 2008-09 holiday break.

Chris Andrews, Jake Brunskill, Nick Trimborne, Linggesh Vahnalingam and Michael Zivic will work at Pinjarra Hills with Professor Paul Lever while Tyson Bradford and Lachlan Palmer will work with Dr Joe Cronin.

John Varghese and Matt Williams (*not pictured*) will work with Professor Ross McAree at the University of Queensland's St. Lucia Campus.

The CRCMining Vacation Program aims to give undergraduate students hands-on experience working on mining technology projects.

IN BRIEF...

Using Dynamic DCF and Real Options

In October, CRCMining and Ernst & Young co-hosted a three-day course on *Using Dynamic DCF and Real Options to Value, Manage and Design Mining and Petroleum Products* at the University of Queensland's Business School Downtown.

The course instructors were Dr Mike Samis (Ernst & Young Canada) and Professor Graham Davis (Colorado School of Mines), who have been jointly delivering this course for more than five years.

The course attracted 28 local and international participants.

CRCMining Tigers roar in UQ competition

This year saw the resurgence of CRCMining's soccer team in the University of Queensland's UQ SPORT competition.

Nicknamed the "Tigers" because of their striped shirts, the team is comprised of CRCMining Pinjarra Hills staff and postgraduate students from the University of Queensland.

The Tigers made the semi-finals in their very first season, eventually losing their semi-final match 4-3 on penalties after a scoreless draw in normal time.

"We were disappointed to miss out on the final in such circumstances," said Team Manager Eddie Prochon. "But of course, the main objective is to have fun!"



Matt Green (*left*, UQ Postgraduate Student) and David West (Research Engineer) in action.

David Wauge

Mechanical Engineer

Location: Wordsmith's Cafe, University of Queensland St. Lucia Campus

In 2003 you were a PhD student at CRCMining, you left for the west coast for a couple of years, and now your back in Brisbane. How does it feel to be back at CRCMining?

Yeah, it's good to be back. It's good to be back in the CRC environment and the uni. It's good to be back working with good people again, smart people. I like that. The research is, I guess, cutting edge, and its stuff that the industry wants. It's good.



Left: David in 2001 (as a CMTE postgraduate student)

Were you based at UQ in 2003?

Yes, I did my PhD with Ross (Associate Professor Ross McAree, CRCMining Program Leader [Shovels and Trucks]) and my Masters with Hal (Associate Professor Hal Gurgenci, UQ Mechanical Engineering). That involved travel over to the US and a bit of travel around Australia as well.

What are you working on at the moment (at CRCMining)?

I'm working on a project with BHP Billiton in Port Headland to deal with ore car detection. They've got what they call a car dumper, so it basically empties the ore cars. There's three different types of rollingstock in a train, they have the locomotive, they've got ore cars and then there's another type of ore car. We have to work out a way of telling which one's which. Potentially that's a project I'm working on. I should also be doing some work with rope shovels, with Ross and a maybe few other things. But still sort of trying to find my feet.

Has CRCMining changed a lot since you were here in 2003?

I think it's become more professional. I think the organisation, the systems behind the organisation have progressed, like it's got more of a safety focus. In Ross' group, they're starting to develop a few systems to ensure quality control, things like that. And that sort of thing wasn't here when I was still doing my PhD. And that's a really positive thing because it's good for the mining companies. They want to see that you're adhering to best practice and it means a lot when you can have something in writing that shows that you've got systems in place to mitigate risk. It's progressed a long way, at least in that respect.

Any major plans for next year? Any holidays planned?

Yeah, planning a potential hiking trip through Nepal, or a climbing trip through Thailand. I'll have to see how it goes, how work goes. See how the finances go as well. But yeah, probably the hiking trip, that'll be good.



I can't leave home without...
...my mobile phone

Favourite memory from childhood?
Surfing on the Sunshine Coast with my friends

Person who you send the most emails to?
My girlfriend in Perth

The best thing about CRCMining is...
...the people!

Cambridge calling

It's never easy to move from Brisbane and a sunny climate to a city where the rain season is a year long affair - unless you've been awarded not one, but two scholarships, that is.

Enter Rohan Shekhar, who began his career with CRCMining in December 2004 as a Vacation student. 2006 saw Rohan receive a CRCMining intern scholarship for his final year thesis and in 2007 Rohan was employed by CRCMining as a Research Engineer, working under Professor Paul Lever in the Dig Technologies work area.

In 2008 Rohan graduated with a Bachelor of Engineering (Mechatronic Engineering) with First Class Honours from the University of Queensland and is a recipient of the University Medal.

More recently, Rohan was awarded the 2008 Sir Robert Menzies Memorial Scholarship in Engineering and the Honorary Poynton Memorial scholarship to conduct a PhD in Engineering at the University of Cambridge.

Rohan credits his time at CRCMining as having had a significant influence in his career choice.

"My time at CRCMining gave me first-hand experience at cutting-edge research," Rohan says, "and it really fostered my interest in a research and academic career."

"It was a great and fulfilling learning experience too, to see many of the skills taught in my undergraduate degree practically applied to real-life research problems."

Living in the UK (and coming back to Australia)

"The main aspect that needed getting used to has been the relative lack of space," Rohan says.

"We tend to have lots of space in Australia, whereas everything is very compact here. It has its advantages though, in that most places are within walking distance."

"Very few people own a car in Cambridge, with most preferring to walk or cycle." (*More than 25 per cent of Cambridge residents use cycling as their primary mode of transport, the highest percentage in the United Kingdom*)

"In terms of the future, my plans at the moment (after completing my PhD) are to return to Australia and conduct postdoctoral research," Rohan says.

"Maybe in the mining industry as my PhD thesis might be mining related. But nothing has been finalised."

So what about the weather?

"Everyone warned me before I left that the weather is not always the best," Rohan says, "it tends to rain at least once a week."

"But I'm very conveniently situated, living wise, only five minutes from my department. So it's ok!"

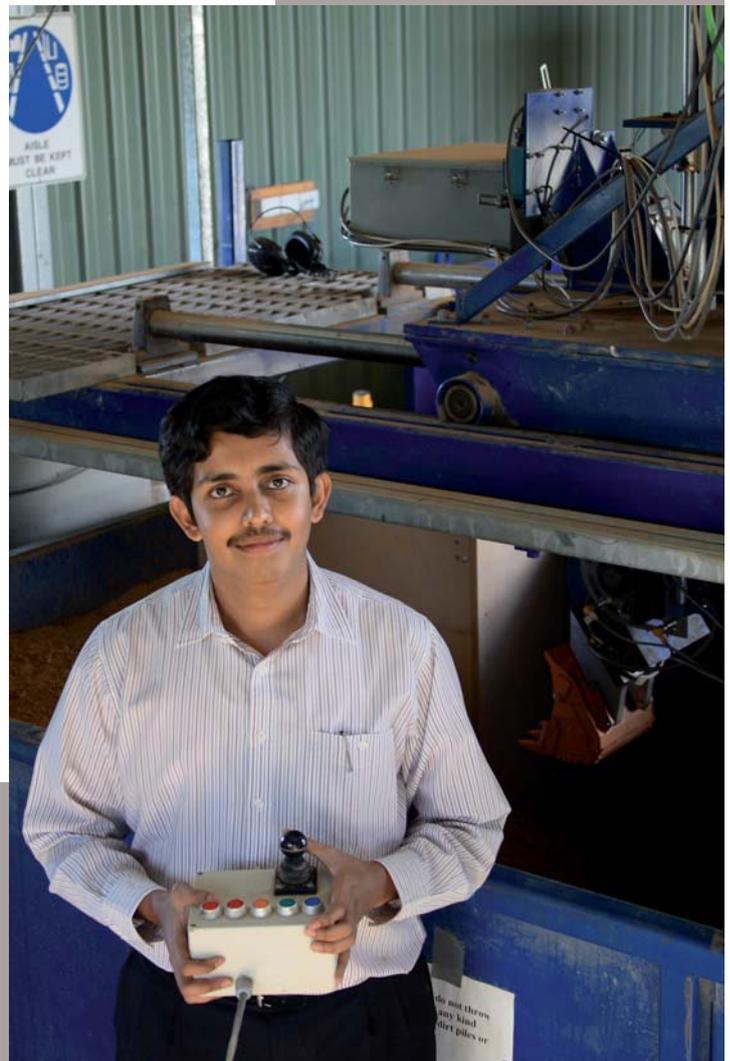
Sir Robert Menzies Memorial Scholarship in Engineering

The Sir Robert Menzies Memorial Trust, with the support of the UK Foreign and Commonwealth Office and Australian Government departments, offers one postgraduate scholarship in engineering for tenure at universities in the United Kingdom for either one, two or three academic years.

The selection committee seeks an individual who is likely to attain prominence in Australia and, in their subsequent careers, make a contribution to British / Australian relations and understanding. Candidates must demonstrate academic excellence, leadership and interest in the service of others.

Cambridge Australia Trust Scholarships

The Cambridge Australia Trust, in collaboration with the Cambridge Commonwealth Trust, awards ten PhD scholarships and one coursework Master's scholarship each year, commencing in October. These scholarships are awarded to Australian graduates of outstanding merit to study at the University of Cambridge.



Left: Rohan Shekhar demonstrating the miniature loading bin facility at CRCMining's Pinjarra Hills site.

2008 Conference wrap-up



Darrell Mann (Hargraves Institute / Systematic Innovation) along with more than 25 presenters, detailing the latest innovations in mining technology.

One of the highlights of the Conference was the Conference Dinner, held at the renowned Lily's on the Lagoon restaurant.

The Centre was once again proud to host the annual Australian Mining Technology Conference at the Novotel Twin Waters Resort on the Sunshine Coast.

The theme for the 2008 Conference was "Smart Technologies for Sustaining the Minerals Boom".

The Conference attracted more than 100 local and international delegates, including a number of students from leading European engineering universities.

The three-day Conference featured international keynote speakers Steve di Antonio (National Robotics Engineering Centre, Carnegie Mellon University) and

Delegates were entertained by the Conference Dinner Speaker, political satirist and actor Bryan Dawe.

In his inimitable style, Bryan spoke about his experiences growing up and treated delegates to a taste of one of his many alter-egos, *Roly Parks*.

The Conference Dinner also featured the unveiling of a new Conference Award, the Don Nicklin Award for Most Outstanding Conference Paper.

The award recognises the contribution made to the Centre by former Chairman Professor Emeritus Don Nicklin.

"Don was a man who contributed much

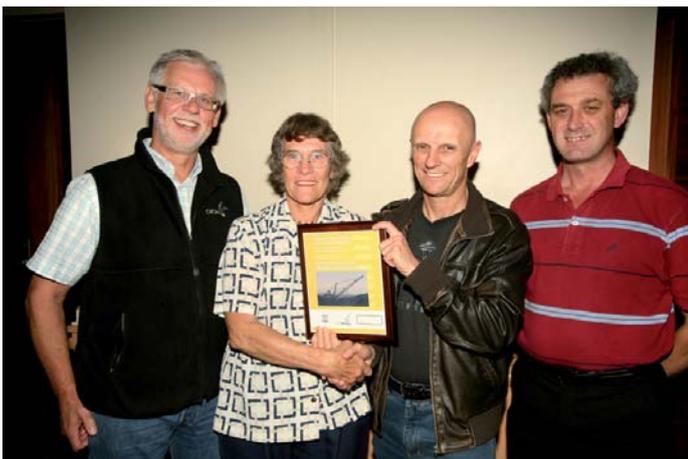


to CRCMining," CRCMining CEO Professor Mike Hood said during the unveiling.

"He played a very large part in making the Centre what it is today."



The inaugural CRCMining Safety Awards were also presented at the dinner. Awards were made in three categories, which can be seen along with the respective winners on the opposite page.

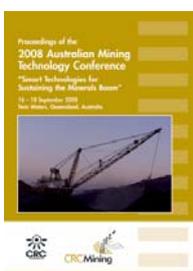


Left: Jo Nicklin presents the Don Nicklin Award for Most Outstanding Conference Paper to Robert Betz and Terry Summers from the University of Newcastle.

Centre Right: Keynote Speaker Darrell Mann (Systematic Innovation) with CRCMining Chairman Laurie Hammond.

Top Right: Conference Dinner Speaker Bryan Dawe.

Top Left: Keynote Speaker Steve diAntonio (Carnegie Mellon University) delivering his presentation, titled *The Urban Challenge and Promise of Autonomous Driving*.



The proceedings of the 2008 Australian Mining Technology Conference held from 16-18 September in the Sunshine Coast, QLD, are available for sale at AUD\$90 (including postage) within Australia. Please contact us for overseas postage rates.

Each year the conference papers are reviewed by a panel of experts prior to publication of the Proceedings. The document is a repository of cutting edge mining technology projects currently underway in Australia.



Scott Adam (right), Tight Radius Drilling project (with newborn son Jack Adam)



The Operator Fatigue Monitoring team



Kevin Austin and Anthony Reid, accepting the award for Best Individual Contribution to Improve Safety on behalf of Ross McAree

The CRCMining Safety Awards are annual awards aimed at recognising the safety excellence of its students, researchers and administration.

Awards are made in three categories: best individual contribution to improve safety; best solution to an identified workplace and/or project safety issue; and best solution to an identified industry safety issue.

Nominations for the 2009 awards will open early next year.



Nicholas Netscher (University of Queensland)



David Johnson (Australian Centre for Field Robotics, University of Sydney)

2008 Australian Mining Technology Conference Awards

The Don Nicklin Award for Most Outstanding Conference Paper

Multilevel STATCOM - Power Quality Control in Mining Applications

Robert Betz, Terry Summers, Brian Cook, Adriano Bastiani (University of Newcastle)

Most Outstanding Presentation

Feasibility of Incorporating Radial Flow Heat Pipes into Haul Truck Tyre Applications

Presented by Nicholas Netscher (University of Queensland)

Most Outstanding Student Paper

Development of a Fast Ultra-Wide Bandwidth SWISAR System for Rock Size Measurement

David Johnson (Australian Centre for Field Robotics, University of Sydney)

2008 CRCMining Safety Awards

Best Solution to a Project Safety Issue

Tight Radius Drilling project (Peter Lugg, Scott Adam, Phil Walden, Mark Gledhill)

Best Solution to an Industry Safety Issue

Operator Fatigue Monitoring project (Daniel Bongers, Eddie Otto, Matt Dyhrberg, Gus Otto)

Best Individual Contribution to Improve Safety

Associate Professor Ross McAree (University of Queensland)

Staff and student movements



David Barry
Mechanical Tradesperson / Research Assistant

David has joined the Centre as a Research Assistant. David has extensive experience in fixed-plant maintenance, including experience on mine sites within Australia and overseas. David is also an expert in outdoor pest control.



Augustine (Gus) Otto
Gus (nephew of Eddie) joins the Centre as the latest addition to the Planning and Production Control work area. Gus is no stranger to the Centre, having worked with Dr Daniel Bongers and his uncle on developing software for the Operator Fatigue Monitoring project.



Juan Camus
Manager - Mineral Resource Planning and Optimisation

Juan is a mining engineer from the University of Santiago (Chile) and holds a Masters degree in Applied Economics and a PhD in Mining Engineering. Juan will be working in the Planning and Production Control work area.



Sharon Ponting
Executive Assistant / HR
Sharon joins CRCMining from the University of Queensland where she undertook a variety of roles within FEPSA. Prior to this, Sharon lived in London for three years and is working on being Australia's next No. 1 ranked women's tennis player.



Aaron Dando
Research Fellow
Aaron recently completed his PhD at the Queensland University of Technology (QUT) titled Robust Adaptive Control of Rigid Spacecraft Attitude Manoeuvres. He also holds a BE (Aerospace Avionics). Aaron will be working in the Dig Technologies group.



Keivan Rafie
PhD student
This is a long overdue introduction for Keivan, who started with the Centre last year as a PhD student. His thesis is on *Conceptual Development and Analysis of Innovative Hardrock Rapid Development Systems*. He is supervised by Peter Knights at the University of Queensland.



Micah Nehring
PhD student
Micah joins CRCMining from Xstrata Copper, where he worked for a year with various rotations as part of Xstrata's graduate program. He will be undertaking studies into Optimized Production Scheduling with Dr Erkan Topal at the University of Queensland.



Mark Smith
Business Support Manager
Mark joins CRCMining from the Institute of Molecular Bioscience at the University of Queensland where he worked as a Finance Officer. Mark previously lived in Scotland for a year, where he developed a taste for good single malts.



Cristian Opazo
Cristian's long and varied pre-CRCMining resume includes work as a business analyst (in Chile) and a hotel manager (in Brazil). Cristian is in Australia to pursue his MBA studies, but is taking a one year sabbatical to work with the Planning and Production Control work area.



David Wauge
Mechanical Engineer
"Waugy" recently rejoined CRCMining as a Mechanical Engineer, having previously been with CRCMining as a postgraduate student. David will be working within the Shovels and Trucks work area and is also the subject of this issues' *Five Minutes With* feature (page 4).