



SAIEE

KZN SAIEE reaching out to its Members

WORKING IN an Environment surrounded by Electrical Engineers, Technologists, Technicians and Artisans I am constantly exposed to the challenges faced by these professionals in Continuous Professional Development in the Electrical Engineering fraternity. There is constant talk of challenges faced by graduates in acquiring experience in the practical application of their theoretical knowledge as well as receiving proper coaching and mentorship.

The KZN SAIEE strategy moving into the future is to create satellite branches within KZN where SAIEE interventions can be hosted and attended by members in the respective areas thus promoting active participation across KZN.

SAIEE's Vision

The vision behind the creation of the respective satellite branches is to provide convenient and cost effective access to the benefits that the SAIEE has to offer to its members (ie. Presentations, ECSA Accredited Courses, Site Visits to places of Interest, Conferences, Coaching and Mentorship to Professionals , etc.). This is envisaged to promote and encourage active participation by its members in the respective areas as well as to provide a platform for growth and development in the Engineering fraternity in these areas.

Realisation of the Vision

In order for this "Vision" to be realised we call upon all our professionals to become active members of the SAIEE and to either attend these interventions OR even volunteer their services to become members of the co-ordinating team of the Satellite Branches. Just being an attendee to the SAIEE interventions, will help improve one's Engineering Skills and marketability in the Engineering environment. These intervention's also afford you the opportunity to network with other "like minded" individuals which creates a platform for you to address challenges that you may experience at work or in terms of your personal growth.

In 2012, the Pietermaritzburg Satellite SAIEE Branch was launched in an attempt to bring the SAIEE services closer to its members in the KZN Midlands area thus making it more cost effective for its members to participate in these events. Several presentations have since been held at Eskom Mkondeni Park (Mkondeni, Pmb) which was highlighted by peers as valuable interventions. It is envisaged that further initiatives to enhance active membership will be forthcoming.



Kacey Maharaj, author of the article is a SAIEE KZN Centre Committee Member and serves on the Satellite Branch Development Portfolio

Benefits of SAIEE Participation

As an Electrical Engineer/Technologist/ Technician/Artisan that is actively participating in the development and growth of these Satellite Branches in your respective areas the ffg benefits can be realised:

- * Acquire CPD credits for the interventions you attend
- * Improve your Engineering knowledge base (especially outside your present field of expertise),
- * Sharing of experiences (yours and other members)
- * Creating lateral thinking and innovation
- * Networking



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Easton LaChapelle was in Durban to present the SAIEE President's Invitation Lecture to SAIEE KZN Centre members and visitors on 16 October (this evening session was hosted by Veer Ramnarain, KZN Centre Chairman at UKZN).



SAIEE 2013 Proposed Programme KZN CENTRE

Date	Presentation / Tutorial / Visit
October	
21/11/13	Presentation/Tutorial/Visit: Morning Seminar: 08h00 for 08h30 to aprox 12h00: Surge and Lightning Protection by Tony Rayner No charge: kindly sponsored by Phoenix Contact South Africa (Pty) Ltd. Numbers strictly limited to 25 – SAIEE members only – Booking essential PLEASE NOTE - THIS EVENT IS NOW FULLY BOOKED Venue: Umsinsi Room, Durban Country Club
December	No Presentation
January	
23 /01/14	Presentation: Introduction to Fibre Optic Communication by Subhash Jagannath RSVP to Gill Nortier, saiee@iafrica.com Venue: Lecture Theatre, eThekweni Electricity Training Centre, 17 Supply Road, Springfield, Durban
February	
4+5/02/14	2 day CPD Course: Mastering Power System Fault Calculations by Piet Swart Contact Gill Nortier, saiee@iafrica.com, for registration forms/costs Venue: Athlone Room, Durban Country Club

Kacey Maharaj Profile



KACEY HAS been employed by Eskom for the past 19 years. He is currently based at Eskom Distribution at Mkondeni Eskom Park where he holds the position of Power System Network Optimisation Engineer.

His career began at Eskom Duvha Power Station in 1994 where he was employed as an Operator and since then he has occupied several other positions within Eskom Distribution (viz. Power System Controller, Operations Support Co-ordinator, Network Management Centre Outage Scheduler, Sub Transmission Project Co-ordinator and Data Acquisition System Principle Technician).

He currently holds a National Diploma from DUT (ex ML Sultan Technikon) and a Management Development Programme Certificate from UNISA (SBL) and is registered as a Professional Technician with ECSA.

Kacey joined the SAIEE as a committee member where he has volunteered to hold the profile of "Satellite Branch Development" as he is passionate about the development of Artisans, Technicians and Engineers in the Electrical fraternity.

Easton LaChapelle presented the SAIEE President's Invitation Lecture to SAIEE KZN Centre members and visitors on 16 October



Teenage engineering prodigy visits UKZN to share with students

SEVENTEEN year old Easton LaChapelle recently visited UKZN to share his experience in the design and development of a prosthetic arm. Lachapelle was hosted by Dr Riaan Stopforth, head of UKZN's Mechatronics and Robotics Research Group (MR2G) Bio-Engineering Unit, in conjunction with the South African Institution of Electrical Engineering (SAIEE).

Addressing students, staff, members of industry and the media, Easton explained how the idea for the robotic arm stemmed from a childhood fantasy. "I thought, how cool would it be to put on a suit and have super human strength", he recalled. From this fantasy, Easton (14 years old at the time) got the idea to develop a robotic arm with a wireless control glove. Making use of the internet, CAD software, 3D printing and composite materials he was able to develop his first generation model.

He entered his creation into a Colorado science fair where he met a 7 year old amputee with a prosthetic arm. After speaking to the little girl's parents he discovered that not only was the prosthetic expensive (\$80 000 = R 785 000), but it had limited mobility and would need to be refitted several times during her life. In what he describes as his "Aha! moment", Easton realised that his passion project could save and change lives.

Second generation

With a new found determination, Easton (at 15 years old) began developing a second generation model. The new model



Dr Riaan Stopforth and Easton Lachapelle (centre) with UKZN Engineering students.

costs \$500 (R 4900) to produce and boasts improved weight, mobility and human likeness. Incorporating the mechanical structure with electronics and artificial intelligence, it is able to "think" for itself and performs tasks depending on the sensory system incorporated in the hand. The control system uses a wireless brain wave sensor, unlike many of today's advanced prosthetics which are controlled by neural implants that require spinal surgery.

Easton demonstrated how the arm worked by bending the elbow to extend the hand. It will only start shaking another person's hand if it detects that the other person has gripped the hand.

Future plans

Easton shared his plans to aid a fellow class mate who was recently paralysed from the waist down. He intends on developing a complete exoskeleton robotic system that

The additional afternoon session was hosted by Riaan Stopforth and arranged for the benefit of the UKZN students

will enable his peer to walk across the stage for their high school graduation.

He is currently working on a third generation system that is more light-weight (2.5 kg) and able to pick up heavy objects (up to 70 kg), by means of improving the efficiency of the actuators within the system.

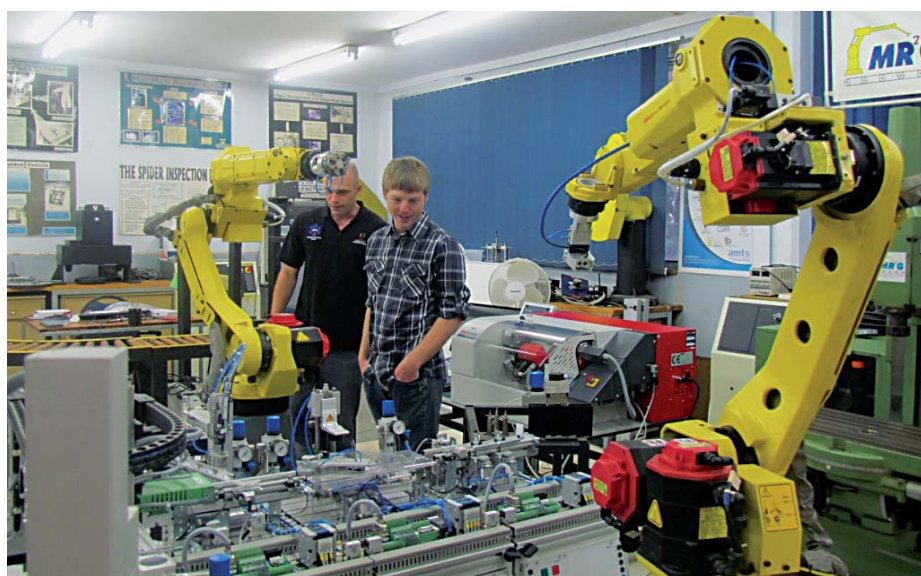
Easton is also looking for a university in the USA that will allow him to explore his diverse interest in Electrical, Computer and Mechanical Engineering as well as Neuroscience and Business.

Knowledge exchange

After the presentation, Easton joined the MR2G Bio-Engineering Unit members in the lab where they compared and discussed the group's own prosthetic arm and hand. UKZN Mechanical Engineering students: Drew v d Riet, Preyen Perumall, Simangalis Ngema and Zaheer Dimala are currently developing a prosthetic for a man who lost his limb when he was struck by lightning. Their design was showcased at the Mechanical Engineering Open Day on the 29 October 2013.

In his closing statements, Easton spoke of the lack of support he received for daring to defy convention and test the system. He then issued a challenge to the crowd, "I challenge you to redefine those systems and redefine those boundaries for everything and to be curious". Easton's example is a great success story in compassion, determination and innovation.

Author: Sashlin Girraj



Dr Riaan Stopforth shows Easton around UKZN's Mechatronics Engineering lab.

Report: IEEE 2013, 6th Robotics and Mechatronics Conference

THE 6TH ROBOTICS and Mechatronics Conference 2013 took place at the University of KwaZulu-Natal, and started on the 29 October 2013 with displays of UKZN Mechanical Engineering final year projects. The media paid rapt attention to the student presentations. One of the projects that attracted the media (and were the winners of the 2013 project prize) was the Modular Myoelectric Prosthetic Arm. This project was initiated as part of the Mechatronics and Robotics Research Group (MR2G) Bio-Engineering Unit, which is headed by Riaan Stopforth. The prosthetic hand project had been in discussion between Riaan and his MScEng student, Drew vd Riet, since 2011. In 2013 Drew started working on a generic system that would allow amputees to control the hand with muscular signals in the upper arm, and also receive feedback signals by means of vibrations depending on feeling. The feeling could consist of temperature, force or texture felt by the prosthetic hand.

The hand has been designed for John Harris, who lost both his hands in 1996 in an accident when he helped a boy to get his kite down from a 33 kV power line which he thought was a telephone line.

A group of final year Mechanical Engineering students, Preyen Perumall, Simangaliso Ngema and Zaheer Dimala, then took on the challenge of customising the hand to suit John's disability.



John Harris using the robotic prosthetic hand to take a drink from the cup which is enabling him to hold.



The Downhill Racing Car Team, winners of the RobMech 2013 prize: (from left) Killian Nair, Kasheel Goberdhan and Akhil Gangaram.

The next day, Brian Hart gave his keynote presentation. Brian is from Black-I Robotics Inc. in the USA. He spoke about the Gemini Scout Mine Rescue Robot, and how it has evolved over the years.

A double session of presentations commenced which involved Manufacturing and Bio-Engineering, after which the delegates had the opportunity to view the final year projects on display, they voted that the best project was the Downhill Racing Car, which won each of the participants a prize.

A Parallel session dealt with Autonomous/Neural Networks and Mining. Robert Holm's keynote presentation titled "Dawn of a New Era: discussed the National Robotics Strategy of South Africa (ROSSA). The Department of Science and Technology (DST) inaugurated ROSSA as an initiative to develop robots for niche markets within South Africa. Different institutions in the country will focus on niche areas.

The last day started with a keynote presentation from Horst Weinerton titled "Festo Bionics: Mechatronics Innovations Inspired by Nature". Bionics, or bio-inspired engineering, is based on the fact that nature has already solved many of the problems we deal with every day. Whether it is energy efficiency, lightweight construction or functional integration; nature has devel-

oped a wealth of optimisation strategies for adapting to its environment, and these strategies can be applied to the world of engineering.

Anton Maneschiijn also gave a keynote presentation on Unmanned Aircraft Systems. The delegates had an opportunity to attend another two parallel sessions that consisted of Manufacturing and Mechatronics and Education.

The conferences ended with the announcement of the best paper award, "Vision-Based Adaptive Cruise Control Using Pattern Matching", by Ritesh Kanjee, Asheer Bachoo and Johnson Carroll.

hopefully RobMech 2013 was a platform for industry partners to boost in research, innovation and development within South Africa.



UKZN Alumnus Horst Weinert presented a keynote address on mechatronic innovations inspired by Nature.