Innovation, Technology Transfer and Commercialisation

Define tomorrow.

UNISA | university of south africa

The Role of the DITTC

contents

PROF THENJIWE MEYIWA

Vice-Principal: Research, Postgraduate Studies, Innovation and Commercialisation

An innovative nation is a competitive nation; a nation that constantly generates new ideas and knowledge, and then applies them to solve problems and create opportunities. Universities are a vital part of South Africa's innovation infrastructure and Unisa is proud to be among the country's top 10 public universities in terms of overall research output, according to the Department of Higher Education's annual analyses of universities' research output.

This positioning has not "just happened" but is an indication that the university is on a path of meaningful renewal, that takes account of the changing context in which it exists. Unisa has worked hard to progress from being an institution where research and innovation were tangential activities to being central to its core business. It continues to work hard and smart to strengthen its contribution as an institution producing quality research that makes an impact and adds value to South Africa's quest for competitiveness.

Just one example of how Unisa is holding the South African flag high is in leading the development of renewable energy solutions for the 2022 Winter Olympics in China. There are other examples, in fields such as nanotechnology, chemical engineering and even black liberation theology, where this University is an acknowledged leader.

Unisa's competitive advantage in R&I is built on several strengths, including a collaborative approach that attracts top researchers and ongoing investment in quality research facilities and equipment, including the state-of-the-art Science Campus in Florida, Gauteng, and the Unisa library, one of the most modern and best-equipped research libraries in Africa.

Going hand in hand with investing in facilities and equipment is investing in human capital; Unisa's existing and future researchers – and this is where Unisa truly stands out. Unisa researchers at all stages of their research careers have access to substantial support in the form of 14 research support programmes, ranging from grant funding for student and staff innovations to fully funded scholarships for staff wishing to complete their masters and doctoral studies. This support has played a significant part in putting Unisa firmly on the research and innovation map.

Actions speak louder than words, however. I invite you to turn the pages of this publication for an overview of what Unisa is doing to help shape a more competitive future for the country and the continent.

PROF LES LABUSCHAGNE

Executive Director: Research, Innovation and Commercialisation

"Once you have an innovation culture, even those who are not scientists or engineers - poets, actors, journalists - they, as communities, embrace the meaning of what it is to be scientifically literate. They embrace the concept of an innovation culture. They vote in ways that promote it. They don't fight science and they don't fight technology."

– Neil deGrasse Tyson

The vision of Unisa is to be the African university shaping futures in the service of humanity. This is a bold and ambitious vision that requires prescient men and women that are prepared to tackle the challenges facing ordinary citizens daily.

Innovation is the great equaliser. Through innovation, the socioeconomic divide can be lessened, and opportunities can be created that never existed before. Without innovation, advancement is not possible. However, innovation in and of itself can do little to bring about change. It is only one side of the proverbial coin. The acceptance of innovation is equally important. The willingness to change by adopting innovation is a collective societal responsibility. This synthesis of generation and adoption is what ultimately creates an innovative culture.

The challenges faced by Africa, and more specifically South Africa, create the perfect conditions for an innovative culture. Not only do we have many brilliant minds ready to create solutions, but we also have many people in need of these solutions. It is the responsibility of universities such as Unisa to facilitate the development and nurturing of this culture.

The university prides itself on the tremendous progress that has been made in developing an innovative culture among its employees and students. A small but highly motivated and talented team in the Directorate: Innovation, Technology Transfer and Commercialisation took on the task in 2012 and the results today speak for themselves. Without this team, none of the following innovations would have been possible. These are examples of what can be achieved through hard work and dedication.

MR AYANDA V. NOMA

Director: Innovation, Technology Transfer and Commercialisation

"Rainforests depend on people (and institutions) who actively bridge social distances and connect disparate parties together – the keystone species"

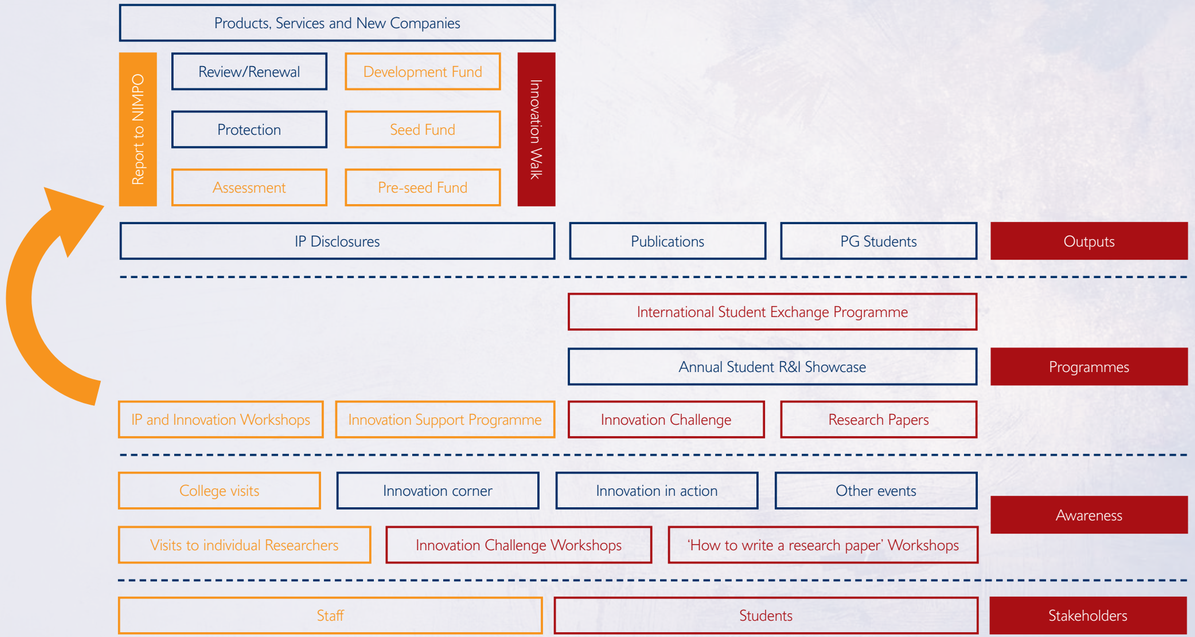
– Hwang and Horowitt

Over the past few years, the Directorate of Innovation, Technology Transfer and Commercialisation (DITTC) has been working hard to entrench innovation and technology transfer as part of the University's key activities and competencies. The DITTC has been building understanding and awareness of the importance of innovation and technology transfer among staff and students. This continues to be a growing activity with more people beginning to appreciate and understand the importance of these concepts in enhancing the impact that the University's research and development can have on society. Research and innovation are drivers of economic growth and restructuring, as well as social wellbeing. There are ample examples of countries that have harnessed innovations to create new capabilities and competencies which have launched these countries on to new and higher growth trajectories. This is relevant for our country as we actively aspire to be a knowledge-driven economy. This national system aspiration requires an engaged and enabled national system of innovation aligned to deliver on this national objective.

Universities, as part of the knowledge generation infrastructure, are better poised to play a crucial role, not only in driving the knowledge economy and the 4th Industrial Revolution agenda, but also as an apt mechanism to solve some of the societal challenges that our country and the continent face.

This imperative to translate knowledge for enhanced socioeconomic good has led to the creation of new "species in the rainforest", which is the national system of innovation, aka innovation ecosystem. Offices of technology transfer (OTTs) are one such "species" to facilitate the translation of technologies developed in the public research organisation into positive socioeconomic outcomes. OTTs exist and operate within a larger ecosystem with various players at national and regional level, who collectively seek to maximise the impact of innovation and technology transfer. The success of an OTT within an institutional setting depends on internal rearrangements of relationships, new understandings and new "species" allowed to emerge within the institution. These new species within universities include new technologies, techno-entrepreneurs, new instruments, support mechanisms and incubation structures, etc. This requires an institutional sub-ecosystem integrally linked and interfacing with the larger ecosystems at regional, national and international level. The DITTC forms part of concerted efforts to build a viable, vibrant and learning institutional innovation ecosystem that is so crucial to ensuring successful outcomes of innovation and technology transfer activities at Unisa. The book showcases some of the important building blocks of such an ecosystem: new technologies, programmes and policies, that the DITTC is responsible for within Unisa.

OUR SERVICES AT A GLANCE



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DISRUPTIVE TECHNOLOGIES TYPICALLY ENABLE NEW MARKETS TO EMERGE.

- CLAYTON M. CHRISTENSEN, THE INNOVATOR'S DILEMMA: WHEN NEW TECHNOLOGIES CAUSE GREAT FIRMS TO FAIL

Technology offerings

“

ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL.

- SUSTAINABLE DEVELOPMENT GOAL 7

”

ENERGY

Effective Heat Removal in Tubular Fixed-Bed Reactors

Technology

The technology relates to an upright tubular fixed-bed reactor body comprising of a heat-dissipating pipe, which extends from the reactor tube wall, to ensure that heat is effectively transferred in highly exothermic reactors such as Fischer-Tropsch, which are prone to heat build-up. The heat pipe is developed using a metallic elongated hermetically sealed tube, which provides robust air control. Furthermore, the reactor comprises a cooling section, to cool the first heat removal medium - when the first heat removal is circulated in the wall shell of the reactor - to ensure effective temperature control during chemical reactions.

Market need

Temperature control is a key component in the synthesis of chemical substances; however, current designs of removing heat in fixed-bed reactors are not effective and this affects chemical reactions. Ineffective heat extraction may result in the development of hotspots, within the reactor, which deteriorates the capacity of the catalyst material, thus, compromising the rate of chemical reaction. Moreover, ineffective heat extraction leads to the deactivation of catalysts, thereby reducing the life-span of the catalysts demanding revision and continual replacement that, in turn, leads to increased operational costs, which are highly dependent on energy input, energy removal, raw material costs, etcetera.

Features

- Two-way path heat dissipation
- Elongated hermetically sealed heat pipe for heat removal
- Each heat pipe has two zones (cooling and heating zone)

Benefits

- Effective heat transfer - no heat build-up
- Improved reaction rates and overall productivity
- Prolonged life-span of catalyst
- Effective temperature and pressure control

Industry
Energy

Creators
D Glasser, X Lu & D Hildebrandt

Stage of development
Prototype

Intellectual Property
Pending Patent Applications (ARIPO, Europe, China, USA & SA), Granted Patent (Australia)

Desired relationship
Co-development partner, investor

Low-Cost Household Wind Turbine

Technology

The invention relates to a low-cost, portable, self-aligning rooftop wind turbine designed to capture moderate velocity wind and generate electricity efficiently for household use. Current large-scale wind turbines in South Africa are located far field and the energy generated must be transported using huge power lines back to communities which increases the cost of energy delivery. The portable self-aligning low cost wind turbine comprises of a small radius innovative blade system to ensure maximum torque per small rotating radius. It uses extreme low cost components. It is portable, and can be installed with ease as add-on to any premises. The cost of purchasing of these systems can be as low as R5000. The energy generated from the system is transported directly into the household system via an innovative electronic controller box fitted directly to the house distribution box.

Market need

The wind energy potential in South Africa is estimated at 67 000 GW, however, only 3 GW of wind energy installation is estimated by 2020. One of the contributing factors to this low penetration is that much of the focus in wind turbine technology has been towards utility scale wind farms. While these play a huge role in the alternative energy generation, there remains a huge potential for roof-top wind turbines for household use. The development of technology targeted towards low-cost household wind turbines will greatly contribute to the success of wind energy technology in South Africa and Africa .

Features

- No Tail Blade and Self-Aligning Mechanism
- Small rotating radius with maximised Torque and Wind Capture area
- Self-regulating with regard to rotation speed
- Micro-Controller Power Extraction and Control

Benefits

- Extreme low-cost and simple production
- Low Cost and affordable for small and medium households
- No or less dependency on grid electricity
- Suitable for application in smaller households as well as custom designed urban wind farms

Industry
Energy

Creator
Lukas Snyman

Stage of development
Prototype

Intellectual Property
Pending Patent Application (SA)

Desired relationship
Co-development partner, investor

Solar Energy Harvesting System

Technology

The technology relates to a system which harvest thermal energy from various sources: from sunlight, cars, power plants, factories and other industries, and converts it into electricity. In this system, heat energy is harvested and then stored in a storage tank, using water as energy storage medium. Hereafter, it flows along a gradient to an energy radiator, and converts a portion of the thermal energy into electrical energy through a special semiconductor array device. To ensure maximum harvesting and conversion efficiency, the system run cycles both during day- and night-time, creating a continuous supply of electricity to household appliances.

Market need

Although photovoltaic (PV) technology supports global energy demand and the quest for low carbon emission technology, cost of PV technology is still high (2.50 R per kWhr over 10 years), and efficiencies of commercially available systems are still low (approximately 10 % efficiency). Energy are also stored in expensive high technology battery systems. PV cells are also only active during peak solar irradiation hours during day time. Thermal energy harvesting systems, however, are much more efficient in collection (approx. 90%), it can be stored easily in water and are extremely cost-effective and environmentally-friendly. Our developed system can harvest and store thermal energy at extreme low cost (0,10 R per kWhr). The stored heat is used for supplying hot water in household applications, while about 30 % of the harvested thermal energy can be converted to electricity through specially developed semiconductor and electronics control technology. Cost of production of such systems can be realised as low as 0.50 R per kWhr over 10 years.

Features

- Thermal energy is harvested from solar and other available thermal energy sources
- Thermal energy are effectively stored in special systems
- Continuous conversion cycle to electricity

Benefits

- Extremely Cost-effective and sustainable
- Continuous electricity supply
- Environmentally friendly
- Limited moving parts extend lifetime of systems
- Scaled systems are possible to supply all the energy needs of a household

Industry
Energy

Creator
Lukas Snyman

Stage of development
Prototype

Intellectual Property
Pending Patent Application (SA)

Desired relationship
Co-development partner, investor

Plastic-to-Energy Anaerobic Gasification

Technology

The invention relates to an energy generating system that makes use of polyethylene plastics that would otherwise result in environmental pollution to produce synthesis gas (syngas). Unlike conventional gasification systems that rely on oxygen, this system ensures that the gasification of polyethylene to generate syngas takes place in an anaerobic state, therefore completely removing the air separation step which significantly lowers energy costs. One novel feature of this system is its ability to recover a portion of the latent heat of water, allowing for a significant improvement in energy production over more conventional designs. This system turns non-recycled plastics into power, turning a harmful waste material into something useful.

Market need

Due to the low production costs and flexible material properties, plastic finds application in multiple areas. However, the disposal of plastics without land filling remains an environmental concern as plastic does not decompose. With the expected increase in the standard of living, the global production of plastic is also expected to grow. Gasification can help with the management of plastic disposal processes while ensuring energy generation.

Features

- Anaerobic gasification
- Recovery of latent heat
- Polyethylene plastic feedstock

Benefits

- Higher energy production and a simplified gasification process
- Low energy costs
- Efficient method of plastic waste disposal

Industry
Energy

Creator
James Fox

Stage of development
Prototype

Intellectual Property
Provisional Patent Application (SA)

Desired relationship
Co-development partner, investor

ENERGY

High Performance Lithium Ion Batteries

Technology

The technology relates to a sol-gel based, uniform carbon-coating method for producing high performance lithium-ion batteries. This method makes use of organic phosphoric acid as carbon and phosphoric sources to produce uniformly carbon coated lithium ion batteries that overcome challenges of low capacity and low energy density that ultimately result in battery failure. This method allows the manufacture of batteries that can batteries be used in applications that need a long-life cycle and significant safety.

Market need

Lithium is the preferred battery material for developing smaller, lighter batteries. Currently, it is largely used for recharging batteries for electronic devices such as mobile phones, digital cameras and power tools. As a result, lithium-ion batteries have become the more sought-after alternative to nickel batteries for use in recharging hybrid and electronic vehicles and energy storage. In responding to the need for energy security, scarcity of fossil fuels and concerns regarding global warming, the move towards hybrid and electric vehicles has brought manufacturers to engage towards improving the existing technology of lithium-ion batteries, to develop more lightweight and efficient batteries that offer greater travelling distance between vehicle charges. Lithium-ion batteries offer higher performance and higher charge rates, all at a much lower cost.

Features

- Stable iron source
- Use of cost-effective material

Benefits

- High performance
- Increased capacity

Industry

Energy

Creators

X Liu, Z-Y Yuan & M Chen

Stage of development

Prototype

Intellectual Property

Pending Patent Applications (Europe, SA, USA & China, Germany & South Korea)

Desired relationship

Co-development partner, investor

“ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL.”

– SUSTAINABLE DEVELOPMENT GOAL 7

WATER

Membrane Distillation for Desalination

Technology

The invention relates to the design of a robust membrane for desalination using membrane distillation (MD). Although MD technology has advanced over the years, it's industrial application for the treatment of brackish water and seawater are still lagging. This invention exhibits advantages over the well-known pressure driven membrane processes as desalination is achieved operating at low temperature, low pressure, less membrane fouling. This membrane is designed with a unique structural morphology with high hydrophobicity and porosity that allows the membranes to achieve up to 80% water recovery. The membranes are resistant to fouling therefore ensuring long-term operation without significant performance deterioration and as a result reducing the cost associated with the replacement of membranes.

Market need

While measures such as water conservation, repairing of infrastructure, catchment and distribution processes have been put in place to address water shortages, existing water sources seem to present a viable long-term solution as it can increase the sources from which water can be obtained. This has therefore presented a wide range of solutions in the treatment of seawater. Desalination processes provide an opportunity to produce large quantities of clean water.

Features

- Highly hydrophobic and porous membranes
- Membranes are resistant to fouling
- Lower operating temperatures and pressure

Benefits

- High separation factor for desalination
- Effective and cost effective
- Long-term operation without significant performance deterioration

Industry

Water

Creators

Edgar Mapunda, Titus Msagati and Bhekie Mamba

Stage of development

Prototype

Intellectual Property

Provisional Patent Application (SA)

Desired relationship

Co-development partner, investor

Recovery of Spilled Crude Oil from Water

Technology

The invention relates to a membrane technology developed using polymeric material to recover crude oil found in water due to spillages. Although several techniques have been employed for the removal of crude oil from water bodies, these techniques are either focused on dissolving the spilled oil making it no longer useful or multiple processes must be used to adsorb and recover oil. This membrane technology presents an affordable solution for the recovery of spilled crude oil from water without dissolving the oil or leaving behind super-hydrophobic membrane soaked with oil in the water. The membrane ensures that the spilled oil is effectively removed from the water and recover oil for further processing leading to re-use of membrane.

Market need

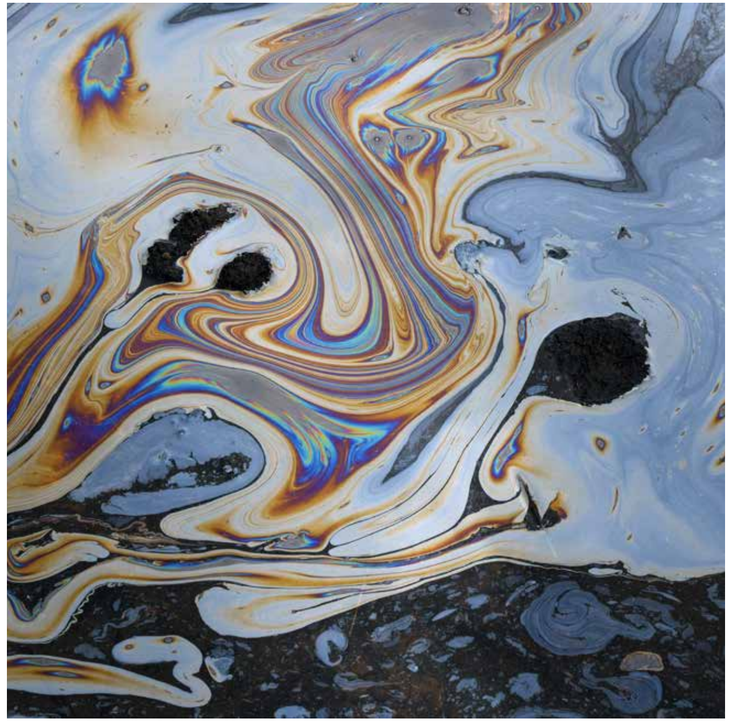
Oil spills remains a challenge in the oil industry resulting in far reaching damages to the economy and the environment. It is estimated that approximately 706 million gallons of waste oil enter the ocean annually. Therefore, any spillage or inefficiency in the removal of spilled oil entails economic loss and possibly also environmental problems. There remains a need to develop affordable membranes with effective and large absorption capacity, good selectivity, re-usability, high oil recovery nature, and insolubility in water. Furthermore, due to valuable nature of crude oil, it is important to develop membrane technologies that is able to recover the oil from the membrane for re-use.

Features

- Membrane with a superhydrophobic and superoleophillic mechanism
- Membrane is developed using waste expanded polystyrene
- Membranes can be used multiple times before being replaced

Benefits

- Efficient crude oil removal from water
- Crude oil recovery from membrane
- Membrane regeneration
- Environmentally friendly process
- Cost effective manufacturing of membrane
- Cost effective recovery process



Industry

Water

Creators

S. Alayande, E. Dare, T. Msagati, A. Akinlabi, & P. Aiyedun

Stage of development

Prototype

Intellectual Property

Pending patent Applications - SA, USA, India, Brazil, Europe, Chine, ARIPO & Canada

Desired relationship

Co-development partner, investor

Acid Mine Drainage using Maghemite Nanoparticles

Technology

The invention relates to the use of maghemite nanoparticles at pH < 5 to remove sulphate, manganese, copper, nickel, cobalt and zinc metal ions from acid mine drainage (AMD). In conventional way of AMD treatment, these pollutants are only removed at higher pH and requires costly alkaline chemicals to remove. The only metals which are known to precipitate at low pH are Iron (III) and Aluminium (III). The pH of AMD is extremely low and in order to effectively achieve almost complete removal of the pollutants, method optimization is required. Relative to the conventional way of treatment, adsorption is highly convenient, cost effective and considered to be noble process. For this invention, a combination of adsorption and precipitation processes have been employed to achieve high metal and sulphate removal. The corresponding removal percentages of pollutants achieved in this study were sulphate (89%), manganese (79%), cobalt and zinc (98%), Nickel (96%) and copper (100%). Overall, the employed method makes use of less chemicals to remediate acid mine drainage pollution under cost effective scenarios, while also the possibility exists for recovering valuable resource from AMD.

Market need

There are several treatment options for AMD. Neutralisation using alkaline industrial chemicals such as calcium hydroxide and limestone are more popular for the removal of metals through metal hydroxide precipitation and sulphate as gypsum, which is a skeleton of sludge builder in AMD . However, since both metals and sulphate are simultaneously precipitate together, it is not cost effective to recover either the metal hydroxides or sulphate from the sludge. The produced sludge is commonly disposed in landfill sites and form enormous tailing, which is also a cause of concern for an environmental pollution due to leaching of metals from the tailings. Cost effective AMD treatment technology is demanded, where recovery and reuse of valuable resources are possible

Features

- High removal of sulphate and metals at low pH
- No additional alkaline chemical required to increase the pH

Benefits

- Efficient and cost-effective AMD treatment
- Water recovery for agricultural use

Industry
Water

Creators
Kebede Kefeni and Bhekie Mamba

Stage of development
Laboratory prototype

Intellectual Property
Provisional Patent Application (SA)

Desired relationship
Co-development partner, investor

Method and Apparatus for Treatment of Wastewater

Technology

A method and apparatus for treating a fluid utilising nanoscience. The impurities in the fluid are trapped by the through charged nanoparticles. The fluid is contained in a reactor that includes a moving magnetic system. When the reactor is in use, the moving magnetic system excites the charged nanoparticles carrying the impurities thus mobilising the particles and the impurities. This reduces the energy requirements as only the particles of interest are mobilised in the system. Since the system contains no moving part, the maintenance costs will be greatly reduced. The system can be tailored for specific applications.

Market need

The problem of removing the particles after purification led to the idea of a nanoparticle that has a magnetic core. These magnetic nanoparticles have been around for a while and many 'removal techniques' have been developed and researched to increase the efficiency of removal. However, these systems continue to utilise mechanical excitation methods of the nanoparticles. The moving parts are subject to wear and tear. The purpose of this project is to build the next generation prototype that utilises a moving electromagnet to move charged nanoparticles in a fluid. It has already been demonstrated in laboratory systems that this system works well to remove specific impurities in water. There is a need to therefore scale this up.

Features

- Magnetic reactor system that utilises an electromagnetic field mobilised nanoparticle
- Achieves a purification with zero moving parts

Benefits

- Produces relatively high levels of efficiency Water recovery for agricultural use
- Efficiently removes impurities in water or any liquid medium

Industry

Water

Creators

V Vallabhapurapu, IW Hofsajer, HO Wei Hua

Stage of development

Lab scale prototype

Intellectual Property

Pending Patent Applications (USA, Brazil, Europe, Japan, ARIPO & SA)

Desired relationship

Co-development partner, investor

Sprinkler Guard

Technology

Conventional irrigation sprinklers which are fitted with rises pipes above the ground are prone to mechanical damage and disorientation. As a result, the lifespan of the irrigation system is shortened or the potential of irrigation systems to optimally irrigate the required surface areas are compromised. Furthermore, the vertical pipes of the irrigation sprinkler that are exposed above the ground are often not fitted in uniform or aesthetically pleasing fashion which affects landscape design. The Sprinkler Guard technology offers an alternative solution aimed at managing the destruction and damage associated with rigid irrigation riser sprinkler pipe while improving the aesthetics of irrigation landscape systems. The Sprinkler Guard is a protective fixture that is positioned around the riser pipe above the ground to protect both the sprinkler and the riser against damage. Designed with aesthetically pleasing features and custom-fitted, the Sprinkler Guard compliments landscape design.

Market need

Due to their extensive use in residential and commercial sectors, sprinklers dominate the landscape irrigation market. Manufacturers of sprinklers invest numerous resources to produce devices that will efficiently distribute water with a high degree of uniformity. However, despite these advances in irrigation systems, their usable lifespan is often short-lived due to mechanical damage which demands replacement thereby increasing costs. Furthermore, water conservation is an on-going concern for the landscape irrigation sector that requires efficient solutions. The Sprinkler Guard technology introduces a solution that protects sprinklers against avoidable damage therefore improving the efficiency and usable lifespan of irrigation systems while providing aesthetically pleasing landscapes.

Features

- Rigid body with a base that sits on the surface to maintain correct positioning of the sprinkler and prevent disorientation of the sprinkler
- The height of the Sprinkler Guard is suitable to match any conventional sprinkler
- Customizable for conventional sprinklers

Benefits

- Guards against mechanical damage - increases lifespan and ensures water conservation
- Suitable for protecting various types of conventional sprinkler risers
- Reduced maintenance / replacement costs for irrigation risers
- Improves the efficiency of the irrigation system
- Improves aesthetics for landscape design

Industry
Water

Creator
Hennie Stoffberg

Stage of development
Prototype

Intellectual Property
Pending Patent Application (SA)

Desired relationship
Co-development partner, investor

Flexible Sprinkler Riser

Technology

An irrigation sprinkler riser technology which comprises of a flexible tabular body which is installed to join from the lateral water supply pipe to the sprinkler head, allowing adjustable positioning of the sprinkler at various angles or directions by means of an adjustable knob. The body of the flexible sprinkler riser is developed using tubular material where an adjustable knob allows for rising or collapsing of the riser depending on the presence or cut-off of water supply. The ability of the riser to collapse when not in use furthermore provides protection of the sprinkler from mechanical damages that may occur if rigid sprinklers constantly remain in upright position. The irrigation sprinkler riser technology therefore offers a simple and adjustable pipe for efficient and cost-effective irrigation.

Market need

Irrigation failures and damage are a result of many factors, including inefficient irrigation systems, the age of the landscape, proximity to trees, rodent activity and vandalism. Although other sprinkler systems have been introduced to support the durability of irrigation systems, many systems still suffer from wear and tear needing constant replacements, making it expensive to maintain. The Flexible Sprinkler Riser technology aims to improve the lifespan of irrigation sprinklers by providing a cost-effective flexible body riser that ensure risers are protected from mechanical damage through the collapsible tubular body and are easily adjustable at various angles allowing optimum irrigation with changes in water pressure.

Features

- Flexible tubular body with an adjustable knob
- Adjustable knob allows for changing angles of irrigation
- Collapsible body when not in use

Benefits

- Irrigates desired locations
- Improves optimum irrigation
- Protect sprinklers against mechanical damage
- Less maintenance costs
- Adjustable knob enables optimum irrigation at variation in water pressure

Industry
Water

Creator
Hennie Stoffberg

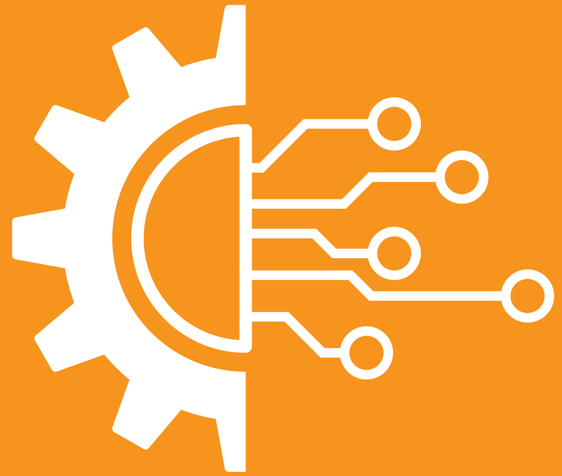
Stage of development
Prototype

Intellectual Property
Pending Patent Application (SA)

Desired relationship
Co-development partner, investor

LEARNING AND INNOVATION GO HAND IN HAND. THE ARROGANCE OF SUCCESS IS TO THINK THAT WHAT YOU DID YESTERDAY WILL BE SUFFICIENT FOR TOMORROW.

- WILLIAM POLLARD



ICT

Academic Staff Rating Index

Technology

Academic staff rating index (AR Index) it is an interactive platform for supervision management. It is designed to enhance the student-supervisor relationship while also providing a rating index for supervisors. AR index aims to improve transparency and quality of academic student supervision by providing information on the quality of supervision within higher education institution. For prospective students, this platform will provide a point of reference when seeking a supervisor. University management and HR can use the rating system to screen candidates for recruitment and to identify the training gaps required for supervisors. Academics (lecturers, teachers, and key personnel) can use the system as a reflective or training diagnosis tool to help improve weaknesses and the quality of supervision. Further, it can be a measurement tool for incentives and for measuring supervisors with good performance.

Market need

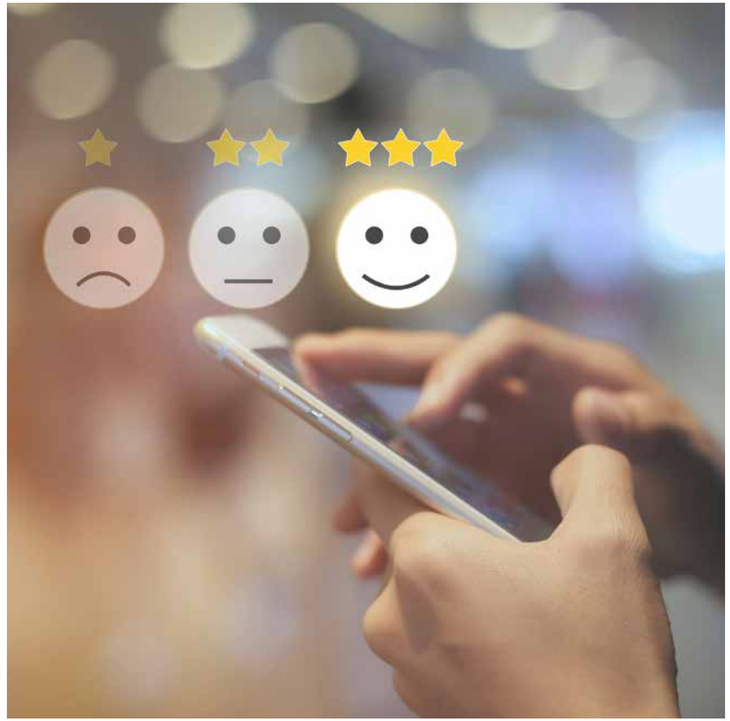
The relationship between research students and their supervisors is of crucial importance both as a channel of intellectual knowledge and for the success of the students as an academic. However, the process of supervision can be complicated by multiple elements resulting in students not completing their qualifications. While universities face a challenge of empowering both the supervisor and the student, the traditional model of supervision is known to disempower the student as it focuses on technical aspects of the supervisory relationship without factoring the process used to shape the student. AR index aims to empower the student by providing a platform where they can access insight into the type of supervision they are likely to receive prior to selecting the supervisor. The platform also allows university management to gain access to the nature of supervision that the students require to improve services.

Features

- Online interactive platform for student and supervisors
- Graduate supervision management system
- Academic supervisor rating system
- Rating feature

Benefits

- Improve transparency and quality of academic student
- Facilitates communication
- Measure performance
- Measure supervision service quality
- HR and management intelligence



Industry
ICT

Creator
Marcia Mkansi

Stage of development
Prototype

Intellectual Property
Copyright

Desired relationship
Co-development partner, investor

Predictive Index Software

Technology

Predictive Index software - Research offers a match-making assessment tool for the academic research sector. It is designed to predict an individual's paradigms and philosophical stance, meaning and implications to research. The software is useful in assisting researchers to determine a paradigm and philosophical stance closest to their beliefs which is ultimately useful in designing a robust research methodology. The novice researcher will use the tool to understand the different philosophical perspectives and the major implications much earlier in their research career. Using the Predictive Index software - Research, universities can align research students with supervisors who share common paradigms and philosophical stance. Ultimately, the tool will improve the quality and the credibility of research produced at universities.

Market need

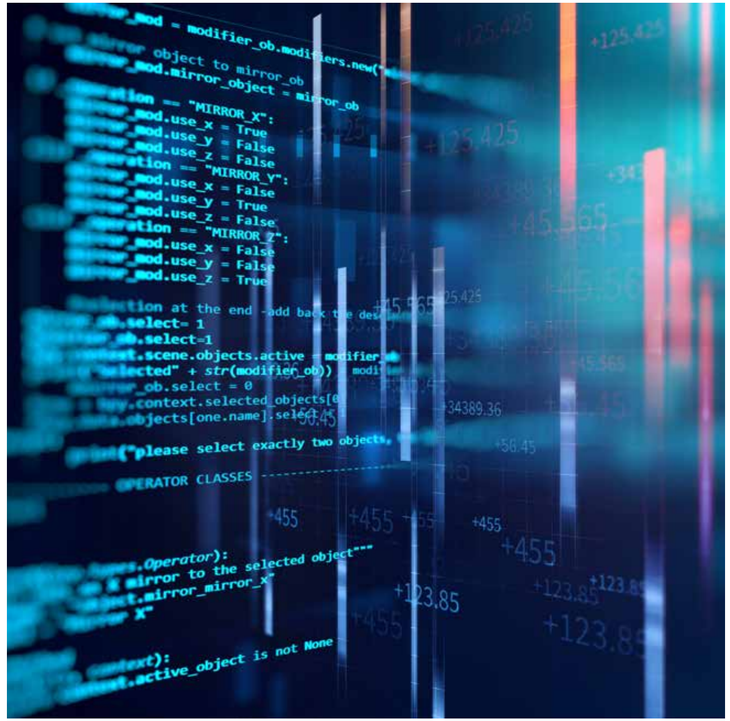
New researchers are often not equipped with the skill of determining an appropriate research methodology and the rationale required to undertake a rigour research project. This is due to the lack of basic tools for aligning the conceptual framework, ontological and epistemological perspectives which is crucial for designing the research methodology. Furthermore, advocates of research methods warns that if these underlying paradigms and philosophies are taken for granted, not identified and discussed; issues of biases and implicit assumptions to certain aspects of the inquiry or phenomena are prevalent. Making it difficult to question, consider and discuss the findings and views of such research.

Features

- Prediction of philosophical stance of research provides a platform for decision making
- Matching philosophical stance with appropriate research questions
- Automated prediction
- Simple to use and easily accessible
- Customizable for all areas of research

Benefits

- Improves the quality research and strengthen credibility
- Enhance teaching and learning
- Increases awareness of the philosophical underpinning and scholarly debate
- A platform for knowledge development and future research



Industry
ICT

Creator
Marcia Mkansi

Stage of development
Prototype

Intellectual Property
Copyright and Pending Trademark Application

Desired relationship
Co-development partner, investor

Photonic Data Processing and Sensors on Chip

Technology

The technology relates to a new generation of telecommunications and data processing technology with improved wavelength sensitivity in the visible and near infrared wavelengths range rather than microwave communication in 2-4GHz. The technology provides the realization of optical sources (LEDs, that can be fabricated directly on silicon chips, thereby overcoming functionality losses and eliminating cross talk and interference as encountered in current processing technology on chip. It utilises low silicon processing and manufacturing technology and standard silicon manufacturing procedures such as CMOS, TTL and RF bipolar processing technology. It can produce complete photonic systems on chip at orders less cost than current existing technologies. The technology also allows the development of new from chip to environment communications systems (LiFi). Furthermore, its broadband emission characteristics (0.5 - 1.2 microns) makes it particularly suitable for the generation of low cost, on-chip micron-dimensioned gas, analyte and bio-sensor systems on chip, that can be realized in low cost and multitude context on chip, used in conjunction with data processing technology. This can align with futuristic Internet of Things (IOT) Technology.

Market need

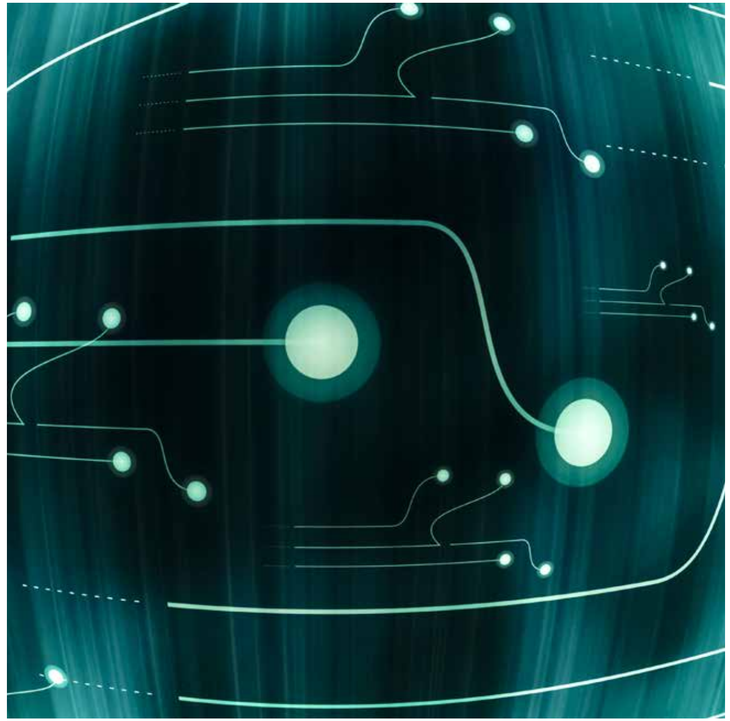
Over the last decade, a tremendous growth in communication technology have been observed. However, there has been concerns in terms of functionality losses and high energy consumption at high bit rates in new emerging technologies. Silicon photonic integrated circuits (SPIC) have been attracting much interest owing to its ability to carrying data at more affordable cost structures. The realisation of a multitude of sensors on silicon chip, will also be in high demand in future in the current rapidly growing Internet of Things (IOT) market.

Features

- High data bandwidth into GHz range
- Broadband wavelength optical sources
- Sensor on-chip capability.

Benefits

- Reduced cost data transmission in Visibe and Infrared wavelength region.
- Eliminates cross-talk and interference on chip
- On-Chip multitude gas, analyte and bio sensor realizations



Industry
ICT

Creator
Lukas Snyman

Stage of development
Prototype

Intellectual Property
Pending patent Applications (Europe, SA, USA & China)

Desired relationship
Co-development partner, investor

Chitosan-Based Resistive Switching Memory Device

Technology

The invention relates to a method of fabricating a commercially viable biodegradable and transparent ReRAM chip with substantially high (>7 orders of magnitude) resistive switching behaviour using low operating power. The method makes use of a simple and affordable scalable fabrication process of an active biodegradable polymer, to produce a transparent ReRAM chip. The device made up of biodegradable material (polymer-chitosan) is reliable for use in next-generation electronic devices as it responds to environmentally sustainability regulation through the reduction of electronic waste.

Market need

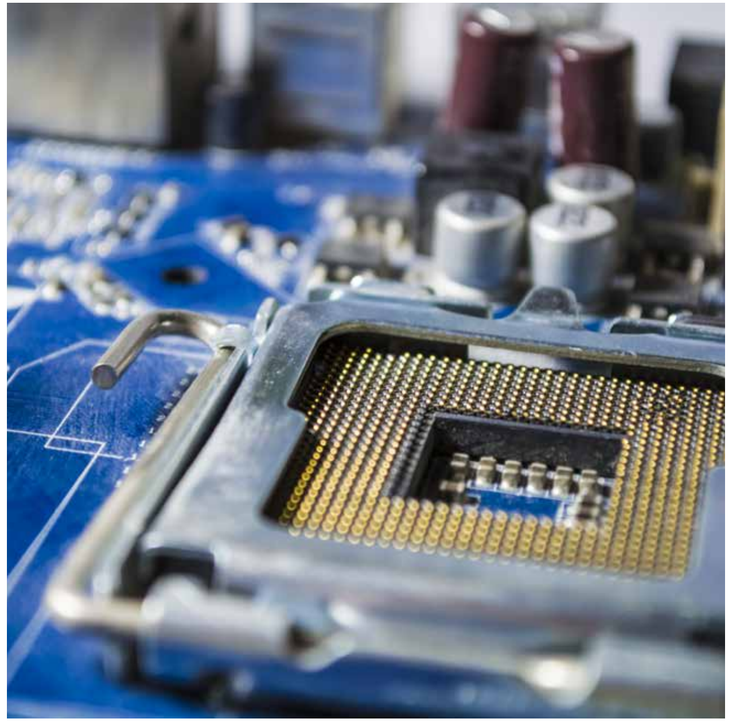
ReRAM has overcome the challenges faced by DRAM and SRAM of content loss by using materials that change resistance in response to voltage. This means that the memory device has good scaling behavior which will not result in memory loss due to the event of power cuts. However, despite their unique features, the use these non-biodegradable (inorganic) material leads to an increase in electronic waste, which is an environmental hazard. Therefore, there remains a need for developing environmentally friendly with a comparative efficiency, therefore reducing electronic waste.

Features

- Chitosan aluminum zinc oxide single layer
- Biopolymer material
- High performance parameter
- Two terminal structure (reduces the amount of hardware required)

Benefits

- Simpler to manufacture (cheaper and readily available material)
- Biodegradable (environmentally friendly)



Industry

ICT

Creators

Ms Sreedevi Vallabhapurapu, Prof Ananthakrishnan Srinivasan & Prof Vijaya Srinivasu Vallabhapurapu

Stage of development

Prototype

Intellectual Property

Provisional Patent Application (SA)

Desired relationship

Co-development partner, investor

ICT

Coordinating the Efficient Distribution of ACTs Drugs

Technology

A mobile application to facilitate the efficient delivery of artemisinin-based combination therapies (ACTs) which is dependent on a multi-embedded supply chain coordination for the distribution of malaria drugs. The challenge associated with the distribution of malaria drugs is hampered by the lack of coordination among the stakeholders responsible for the delivery. This is due to the multi-dimensional logistics that is dependant of stakeholders. The application aims to improve the access to ACTs by providing a mobile-based coordination of the delivery of ACTs. The application is operated using both internet and USSD functionality thereby coordinating the delivery of ACTs in both urban and remote locations. By increasing the access to ACTs, the maximum efficacy of the drug will be achieved, and patients will receive adequate treatment outcomes.

Market need

Access to ACTs for patients in remote or rural areas remains a challenge due to the limited healthcare facilities in the area. It is costly for patient who must travel to long distances to access the drugs. As a result, treatment is often compromised due to lack of finances, thereby causing patients to miss their prescription and increasing the opportunity of the emergence of drug resistance.

Features

- Cross systems application (mobile, desktop) to ensure access over various platforms (USSD and online)
- Live tracker to record, monitor, update and stock levels and the distribution of stocks
- Multi-stakeholder interface to allow users with various roles and security
- Economic Order Que alert feature to manage stock for warehouse supply
- Overstock alert feature to support forecasting and budgeting
- Network transparency tool

Benefits

- Coordinated and transparent distribution
- Improved access to ACTs drugs
- Stakeholder management

Industry
ICT

Creators
Marcia Mkansi & Oluka Nigitta

Stage of development
Prototype under development

Intellectual Property
Copyright

Desired relationship
Co-development partner, investor

Grocery Delivery App

Technology

The technology relates to an application that allows the efficient delivery of groceries ordered online by using a car lift service from general road drivers. Unlike existing delivery applications, this platform does Increase the reliance on dedicated delivery vehicles but makes use of a network of general road users to participate in the collection and delivery of groceries purchased online by other users. By using the shared value model, the application offers cost-effective delivery of groceries while ensuring transparent and effective delivery of groceries by linking customers and grocery e-retailers within a defined radius in order to enable participation in the customer-retailer supply and distribution. As a result, the costs associated with supply and distribution are lowered.

Market need

While e-commerce has significantly Improved supply chain by speeding up the delivery of goods and improving customer experience. It Is the last-mile delivery that Is faced with numerous challenges. The challenges associated with last mile include cost, transparency, efficiency and friction. Although the delivery costs of the last mile are often passed to the customer, transparency, efficiency and frictionless delivery are utmost Important features for customers who make online purchases.

Features

- On-Demand grocery delivery by general vehicle users
- Real- time tracking
- User rating platform
- Safe payment platform

Benefits

- Simple, efficient and transparent delivery of groceries
- Cost effective
- Ease of management
- Users can make informed decisions

Industry
ICT

Creator
Marcia Mkansi

Stage of development
Prototype

Intellectual Property
Copyright

Desired relationship
Co-development partner, investor

“AFRICA’S FUTURE IS INNOVATION RATHER THAN INDUSTRIALISATION.”

- WORLD ECONOMIC FORUM

MANUFACTURING

Automatic Healthcare Assistance Device

Technology

Automatic Healthcare Assistance Device (AHAD) is a multi-functional healthcare assistance device to support people with visual, mobile and speech impairments. The device makes use of robotics, telemetry, sensors, voice control features to provide a range of functional support to patients and the aging population, people with physical and mental disabilities and walking impairments.

Market need

The World Health Organisation estimates that over 15% of the world's population has some form of disability and up to 3.5% of adults have significant difficulties in functioning[1]. Furthermore, there is an increase in the rate of disability due to population ageing. Much of the healthcare needs for disabilities remain unmet due to the lack of adequate healthcare systems. Disability has limitations in the ability to perform life activities as a result of impairment. There remains a huge need to improve the healthcare outcomes of people with disabilities.

Many types of diseases can impact speech, mobility and visualisation. Conditions such as paralysis, cerebral palsy, stroke, multiple sclerosis, muscular dystrophy, arthritis, spinal cord injury can result in mobility, visual and speech impairments that require supportive devices for the patient to regain functionality. Canes, walkers, and wheelchairs are the gold standard instruments for supporting these impairments; however, a patient may still require multiple devices to regain full functionality.

[1] http://www.who.int/mediacentre/factsheets/fs352/en/

Features

- Single device that provides multi-functional healthcare assistance
- Fully automated healthcare device
- Increased efficiency

Benefits

- Improved patient support

Industry
Manufacturing

Creator
Maria M Jakovljevic

Stage of development
Prototype

Intellectual Property
Granted Patent (SA)

Desired relationship
Co-development partner, investor

Floatation Device

Technology

Floatation Device is a system that acts as an anchor and elevator for equipment, shacks and mobile houses that would otherwise be affected by flooding. During the rainy season, the Floatation Device elevates the items away above the storm water and provides stability to secure items from damage or drifted away by the water.

Market need

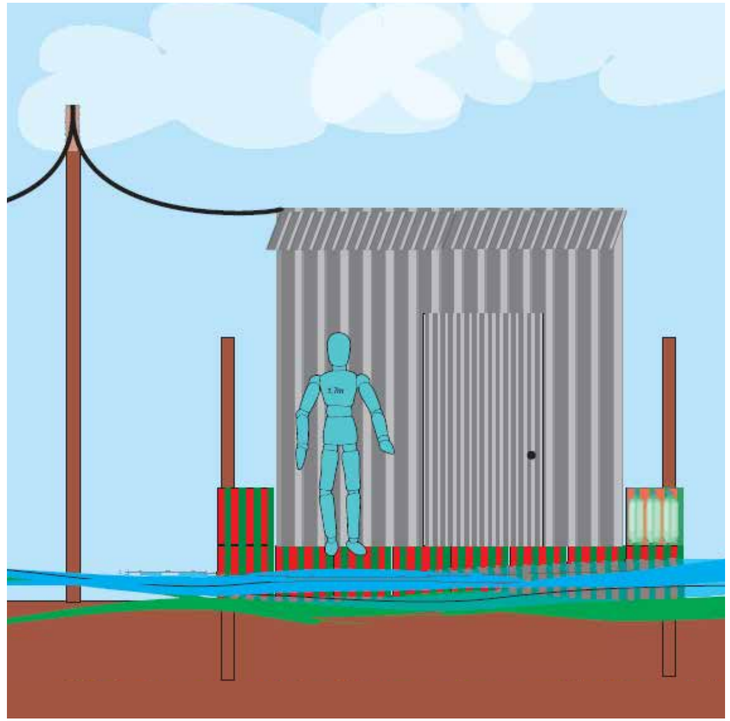
Flooding in South Africa is estimated to have a frequency of 37.9% annually and informal settlements are affected the most. The devastating effects of flooding of shacks in informal settlements in South Africa are an increasing challenge. The Disaster Management Centres in various cities continue to provide intervention for affected communities in different provinces during the rainy seasons. Although municipalities work hard in providing solutions by providing regular flood awareness campaigns and passive and active flood warning signs, there remains a need for the development of technology to reduce the effects of flooding. The Floatation Device offers a solution for preventing flooding in informal settlements and reducing the number of communities displaces due to flooding.

Features

- To elevate a shack base (foundation), so that flood water runs underneath.
- Special interlocking system
- Crates specially built so that the base can be extended if need be.

Benefits

- Convenient and efficient patient support
- Valuables inside the shack are better protected from water.
- Reduce flood victims in and around susceptible areas.



Industry
Manufacturing

Creator
Patricia PM Gouws

Stage of development
Lab scale prototype developed

Intellectual Property
Granted Patent (SA)

Desired relationship
Co-development partner, investor

Waste Beer Recovery

Technology

The technology relates to an improved method for reclaiming waste beer from a brewing process. The process ensures the sterilization and re-use of beer that would otherwise be lost in the brewing process due to contamination. The method focuses on recovering beer lost in the fermentation stage treating it with ultra violet (UV) light and recycling it back to the fermentation process. When a large amount of beer is lost during the excess yeast removal, the UV sterilization step will ensure that this beer is sterilized to acceptable standards introduced back into the process. While many different techniques have been introduced to recover the valuable amount of beer that is lost during the yeast removal, each technique purveys different results in terms of the beer taste (quality), implementation, and ease of use as well as financial returns. The significant role played by these techniques is the reduction of the amount of beer and water lost. However, the concentration and taste (quality) of beer remains a greater concern.

Market need

A significant amount of beer is lost during the removal of the unwanted yeast in the brewing process. For example, for each 1000ml of yeast removed, up to 400ml of this volume consists of beer which is wasted. On the other hand, beer production requires significant amount of water which may amount to 3.5 litres to produce 1L of beer. This means that beer that is lost during the removal process equates to the loss of water used during that beer process (3.5 litres) times the volume of beer lost) as well as water required in growing and processing raw materials for brewing process. This signals that the amount of water that is being wasted during the brewing process is significant.

Features

- UV light beer sterilization
- Recycling of sterilized beer back into the brewing process

Benefits

- Treatment of wasted beer
- Increased brewing efficiency
- Water conserving

Industry
Manufacturing

Creators
John Dewar and Craig Groeneveld

Stage of development
Prototype

Intellectual Property
Patent applications pending (USA, SA, Brazil, Europe, China, Russia, Europe & SA)

Desired relationship
Co-development partner, investor

Cost-effective Mass Production of SQUIDs MRI Technology

Technology

The invention relates to an automated process for fabricating nano and micro structures using high temperature superconducting quantum interference device (SQUIDS). This method overcomes the high cost and complexity in the manufacturing process of superconductors for a commercial scale or mass production. The method applies well-known Femptosecond Laser-based method to fabricate micro and nano – constriction type structures using an automated programme, providing better control, pre-programmed manufacturing of an array of superconductors.

Market need

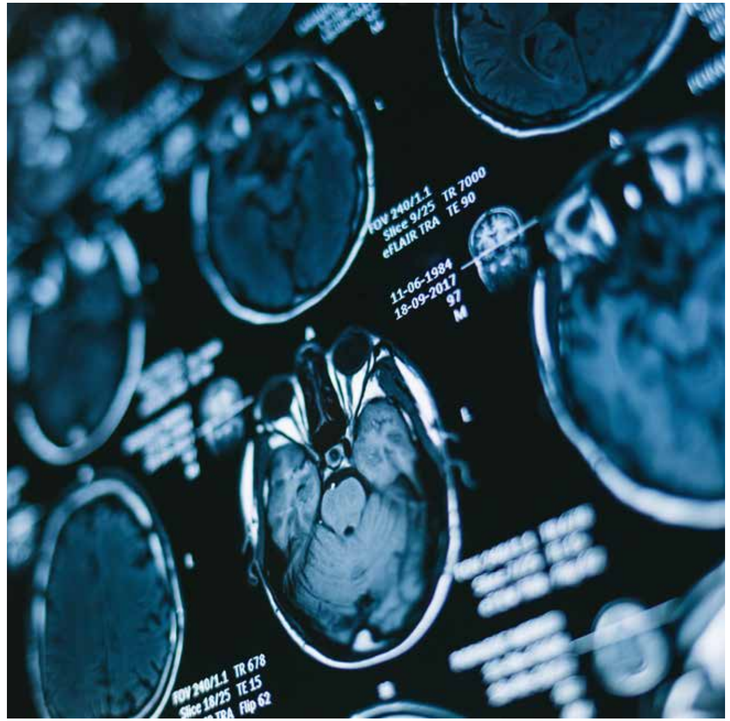
Today, reliable and stable thin-film Josephson circuits can be manufactured in large quantities. However, the production process of good quality SQUIDs is not simple. The main challenge is the technically demanding and reliability of the fabrication process of high temperature superconductors. Most well-established fabrication technology fail, particularly at nano-scale. The main challenge is the technically demanding and reliability of the fabrication process of high temperature superconductors. Most well-established fabrication technology fail, particularly at nano-scale level. Even the extremely sensitive SQUIDs present challenges when it comes to manufacturing.

Features

- Automated manufacturing process of high temperature superconductors
- Produces perfect interfaces and uniform barriers which ensures good reproducibility
- Improved signal-to-noise ratio and increased strength and performance of the SQUID

Benefits

- Computer aided manufacturing language provide for faster manufacturing of SQUIDReduce costs for mass production
- Production of viable SQUIDs technology



Industry
Manufacturing

Creators
Patrice Umenne, Vijaya Srinivasu Vallabhapurapu

Stage of development
Prototype

Intellectual Property
Pending Patent Applications (China, SA, Australia, India, Europe)

Desired relationship
Co-development partner, investor

2

Innovation support @ Unisa

For staff members

Innovation Support Programme (ISP)

Seed Funding

For students

Innovation Challenge (IC)

Annual Unisa Student Research Innovation Showcase

DO NOT PREDICT
THE FUTURE,
MAKE IT.

- MAMMO MUCHIE

Innovation support programmes ***for staff members***

Innovation Support Programme (ISP)

The Innovation Support Programme (ISP) aims to encourage and support all Unisa staff members including academic associates, in developing new innovative research projects that offer solutions to societal challenges. Funding is available for novel or innovative projects in the form of a grant for projects across all disciplines.

Award money

Each project is funded to a maximum amount of one hundred thousand rand (R100 000).

General eligibility criteria and requirements

- The programme is open to all Unisa staff members
- Projects must offer innovative solutions to clearly defined societal challenges
- Projects can, but need not, originate from staff members' research projects
- Preference will be given to collaborative or joint projects
- Priority will be given to collaborative or joint groups
- Preference will be given to multidisciplinary, interdisciplinary and transdisciplinary projects

Application process

Calls for applications are issued twice a year. Applicants must complete the application forms, which should be signed by the applicant or the lead researcher in the case of a joint or collaborative project.

For PARC members – the form should be endorsed by the member's Director and Executive Director/or Line Manager.

The application forms should also be endorsed by the following:

- Chair of department
- Chairperson of the College Research and Innovation Committee (CRIC)
- Director of School
- Executive Dean

Assessment criteria

The Innovation (50%)

The innovativeness of the approach proposed toward resolving an identified challenge, and the appropriateness of the proposed solution to resolving the identified challenge. The approach would be considered novel/new if the proposed solution has never been used before, or the proposed solution is known but has never been applied to the identified or related challenges.

Feasibility (20%)

The appropriateness of the proposed solution to addressing the identified challenge, the ability of the team to undertake the project within the proposed timeframes, and the appropriateness of the budget.

Overall quality of the submission (10%)

The coherence of the application/proposal, the clarity and coherence of the motivation for the identified challenge and the suggested solution, clear articulation of the advantages of the suggested solution vis-à-vis other available solutions, and a clearly motivated budget.

Potential Impact (20%)

The potential impact the proposed solution would have if implemented.

Reporting

Awardees submit quarterly reports during the first 12-month period.

Seed funding

"Bridging the gap between research and commercialisation"

To assist with the translation of research into fundable projects, the DITTC administers the Seed Fund on behalf of the university. The Seed Fund is an initiative of the Technology Innovation Agency (TIA) that supports the commercialisation of intellectual property emanating from universities.

Fundable activities

The following is a list of fundable activities that the applicants may undertake to bring them closer to proof-of-concept (fundable activities can be outsourced to a service provider):

1. Develop initial product, process (comprehensive technology package) and prototype development
2. Sourcing of intellectual property opinions
3. Production of market samples and/or associated testing
4. Refining and implementing designs
5. Conducting field studies to test the assumptions made about the technology, market and/or customer needs
6. Support of certification activities and specification sheet development
7. Piloting and technology scale-up
8. Techno-economic evaluation studies
9. Detailed primary market research
10. Business plan development

Non-fundable activities

1. ***Salaries***
   Salary contributions to university staff members.
2. ***Early-stage research***
   Early-stage research projects.
3. ***Bursaries***
   Students can be contracted to perform specific tasks that are directly related to the project only.
4. ***Potential Impact (20%)***
   Equipment, except for specialised equipment that is within the budget constraints and required to enable qualifying activities.

Eligibility

Applications are open to Unisa staff members

Funding parameters

- Protected or protectable intellectual property is required;
- Up to R650 000 (six hundred and fifty thousand rand) will be provided per project;
- 12-month projects;
- TIA receives first right of refusal to fund further development of the outputs of the project.

Application process

The DITTC issues a call for applications inviting eligible applicants to apply. Calls are advertised on Unisa marketing platforms.

INNOVATION IS A CONVICTION THAT THINGS COULD BE BETTER.

- RAPELANG RABANA

Innovation support programmes ***for students***

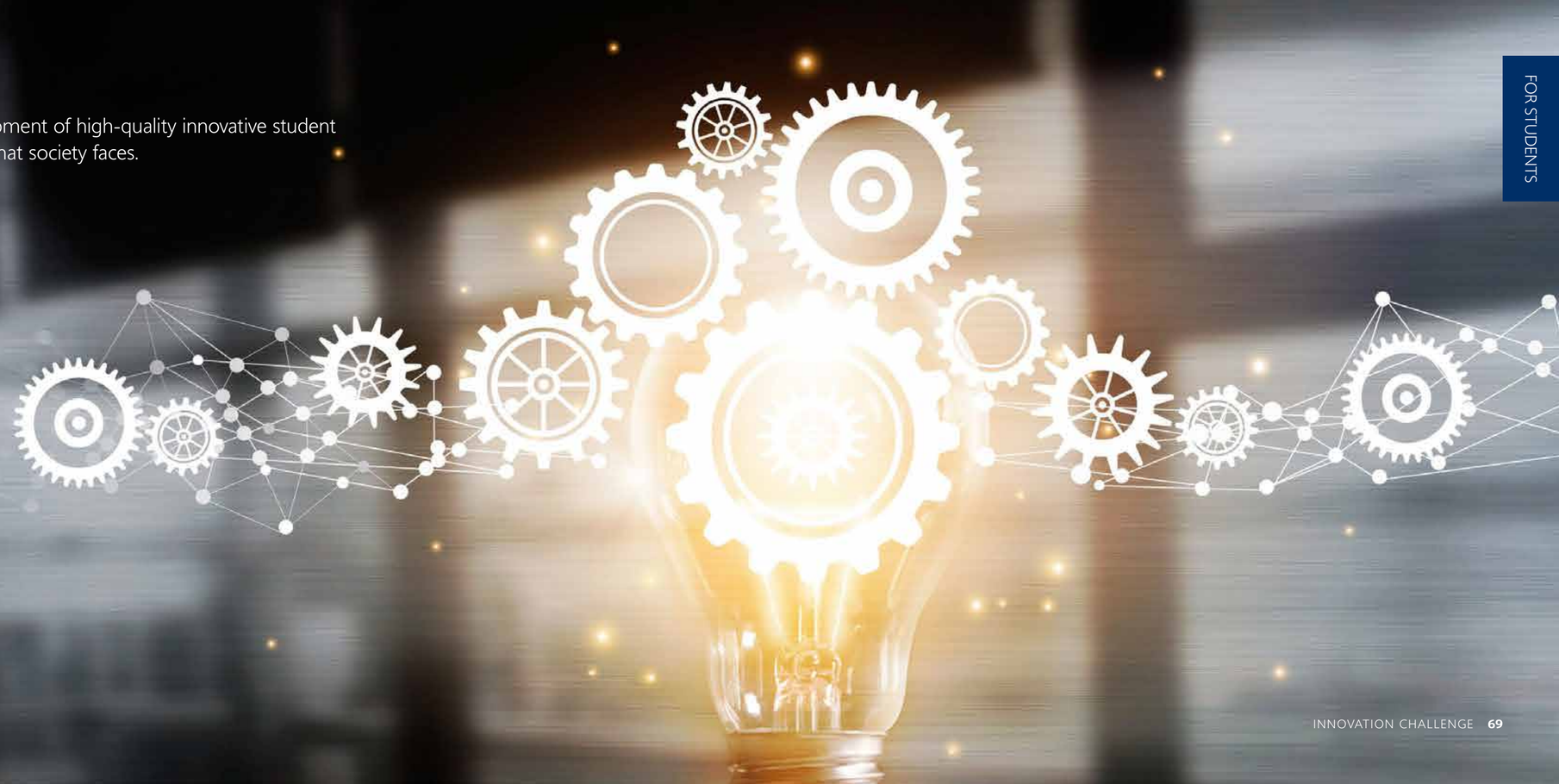
Innovation Challenge (IC)

Unisa, through the Innovation Challenge, aims to stimulate the development of high-quality innovative student projects, which seek to provide innovative solutions to the challenges that society faces.

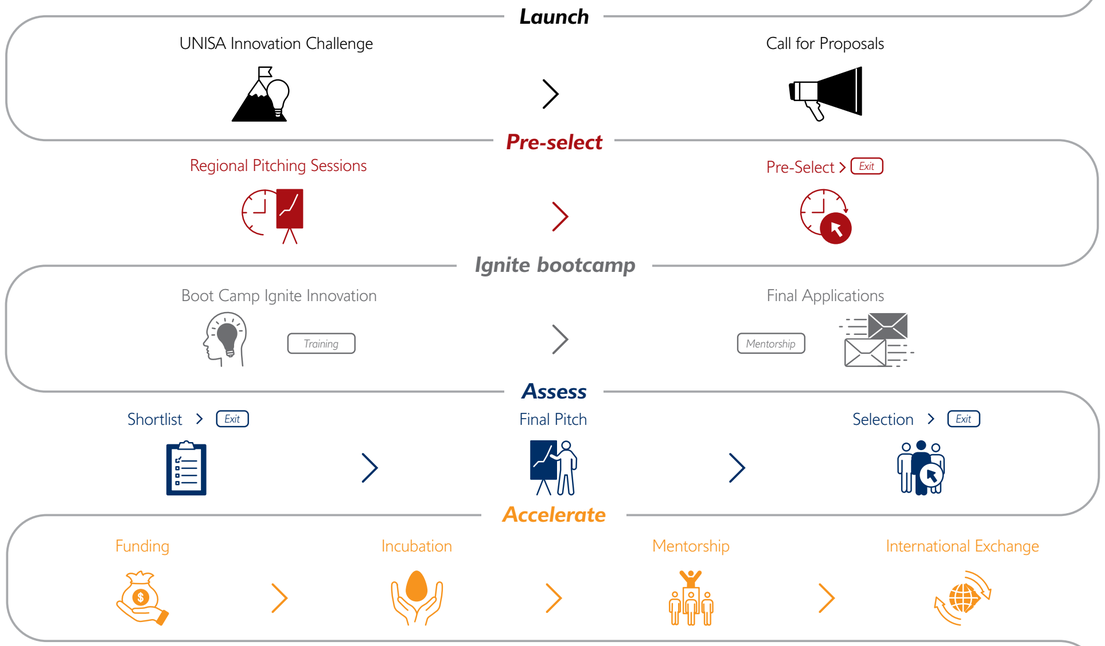
General eligibility criteria and requirements

- The programme is open to all registered Unisa students
- Projects can, but need not, originate from students' studies
- Individual or group proposals welcome

The innovative idea should be targeted at addressing an identified societal challenge. An idea is considered innovative if it is new and has not been implemented before to solve the identified societal challenge. It is also seen as new if it is an improvement on existing solutions wherein the improvement provides a significant benefit to the target audience or market.



Application and assessment process



Launch

- The call for proposals will go out at the end of February each year.

Pre-select

- All interested students or groups of students wishing to enter their innovative idea/business concept as part of the Unisa Innovation Challenge are required to pitch their innovative idea/business concept before a panel of experts.
- Pitching sessions will be organised in most of the Unisa centres. For a pitching session near you, check the notice boards.
- Prepare a 5 to 7-minute PowerPoint presentation
- The Pitching Panel will score all pitches based on the following criteria:

Problem definition (20%)

The extent to which the challenge being resolved has been clearly identified and defined.

Innovativeness of the proposed solution (50%)

The extent to which the solution is new or is a significant improvement on an existing solution.

Feasibility of the proposed solution (20%)

The extent to which the proposed solution is feasible having regard to the technical aspects of the project, timelines, team, partnerships, financial resources, etc.

Potential impact of the proposed solution (10%)

The extent to which the proposed solution will impact positively on the identified challenge.

Ignite bootcamp

- The best ideas/concepts will proceed to the next phase.
- All students whose ideas/concepts have been selected will be required to attend a 2.5-day boot camp on innovation.
- At the end of the boot camp, it is envisaged that students will leave with an advanced draft of their Unisa Innovation Challenge proposal.
- Students may be allocated a mentor.
- Students will have until the stipulated closing date to submit their final applications. No late applications will be accepted.

Assessment

- All complete applications received will be reviewed by an Innovation Challenge Selection Committee.
- The mandate of the committee is to review all applications and shortlist those applications it thinks have merit.
- Complete applications will be assessed by the IC Selection Committee using the following criteria:

Innovation (35%)

The extent to which the proposed solution is innovative and differs from existing solutions.

Team (15%)

The extent to which the team has the requisite expertise to develop and/or implement the proposed solution. In the case of an individual applicant, this refers to the extent to which the individual has the requisite expertise to develop and/or implement the proposed solution.

Sustainability (10%)

The extent to which the team has developed a sustainability plan for their proposed solution.

Potential Impact (10%)

The potential impact the proposed solution would have if implemented.

Problem definition (5%)

The extent to which the applicant has a clear understanding of the challenge identified.

Feasibility (15%)

The extent to which the proposed solution is feasible having regard for the technical aspects of the project, timelines, partnerships, financial resources, etc.

Quality of the Submition (5%)

The coherence of the application/proposal, the clarity and coherence of the motivation for the identified challenge and the suggested solution, clear articulation of the advantages of the suggested solution vis-à-vis other available solutions, and a clearly motivated budget.

Customer/user definition (5%)

The extent to which the applicant has identified the appropriate customers and users. The extent to which the applicant has undertaken customer discovery.

- A maximum of 20 ideas/concepts can be shortlisted.
- Students whose ideas/concepts have been shortlisted will be invited to present to an external panel of judges for a final assessment. The final presentation will take place during the Annual Unisa Student Research and Innovation Showcase.
- The winners will be selected and announced during the Awards Ceremony at the end of the student showcase.

Accelerate

- A maximum of 10 projects can be supported.
- Each project will receive the following financial and non-financial support:
  - R100 000 per project, which will be used towards the development of the concept or idea. Additional funding may be made available depending on progress and compliance with all conditions of grant. The funding will be dispensed in tranches based on progress.
  - Access to a dedicated mentor to assist with development and implementation of the idea/concept.
  - Access to incubation services where available.
  - Access to a commercialisation specialist, IP specialist and product design professional.
  - Assistance with marketing the idea/concept.
  - Opportunity to participate in an international student exchange.

Reporting

Quarterly reports to be submitted to the DITTC for a period of one year after the grant was awarded.

Annual Unisa Student Research and Innovation Showcase

The Unisa Student Research and Innovation Showcase is a joint initiative of the Unisa Research and Innovation portfolio and the Unisa National Student Representative Council (NSRC). Through this initiative, the two parties seek to promote Research and Innovation among Unisa students, and to create greater awareness of the importance of Research and Innovation as tools for socioeconomic development and progress.

A Call for Abstract is issued each year to students in all disciplines to submit research papers, which are reviewed and selected for presentation during the Annual Unisa Student Research and Innovation Showcase.

Students are invited to submit abstracts in any of the following disciplines:

1. Arts
2. Humanities
3. Natural and Physical Sciences
4. Social Science

Eligibility

The showcase is open to all registered students for the current year (undergraduate and postgraduate) from all disciplines except academic staff members.

Application Process

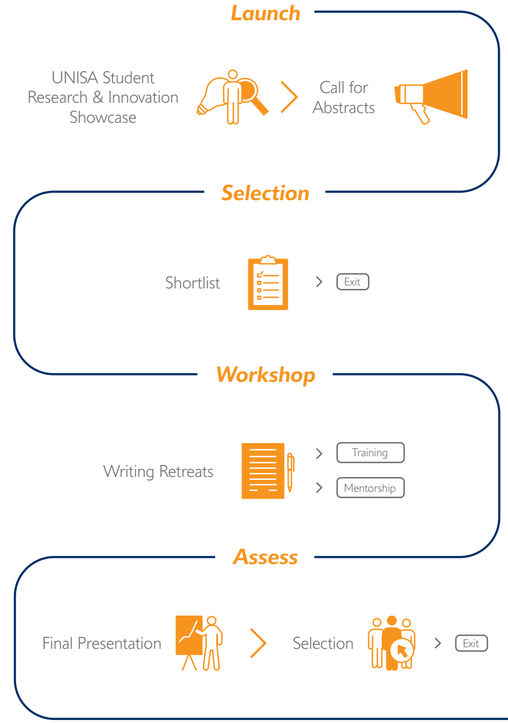
- Students wishing to participate in this programme must submit the following:
  - The submission form;
  - An abstract; and
  - Proof of registration.

Please note that abstracts that exceed one (1) page will be rejected without further consideration.

- Abstracts will be evaluated by a discipline specific technical committee based on the following criteria:

Scientific Intellectual Merit (50%) | ***Originality (20%)*** | ***Potential Application (15%)*** | ***Overall Quality (15%)***

- The students with the best abstracts from each discipline will be invited for a writing retreat on how to write a research paper.
- At the end of the writing retreat, the students will present their research at the Annual Unisa Student Research and Innovation Showcase.



FOR STUDENTS

Award money

- The winners will receive trophies.
- The winners and runners-up will receive certificates.
- The cash prizes per category in each discipline are as follows:

	Undergraduate and Honours *(Oral presentation)*	***Masters*** *(Oral presentation)*	***PhD*** *(Oral presentation)*
Winner	R5 000	R5 000	R5 000
First Runner-up	R3 000	R3 000	R3 000
Second Runner-up	R1 500	R1 500	R1 500

- The winners in each category may form part of a Unisa student delegation to go on an international visit to another institution provided they have not participated in the programme before.
- The winners in each discipline will be announced during the award ceremony.

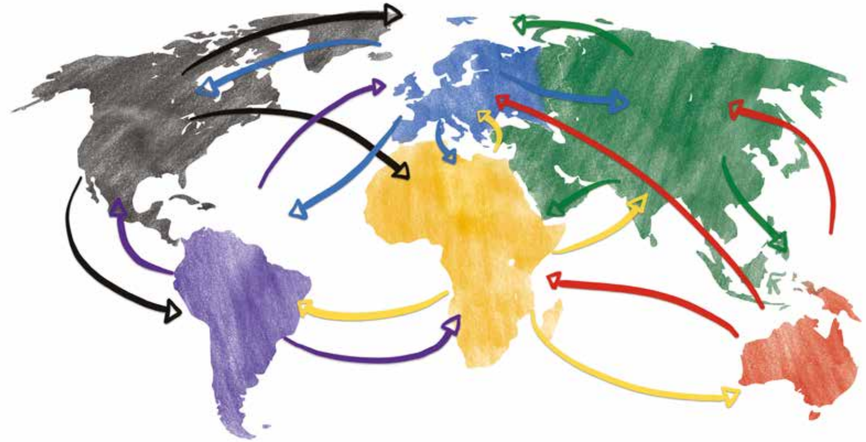
For more information send an email to: ***showcase@unisa.ac.za***

International Student Exchange Programme

The Research, Postgraduate Studies, Innovation and Commercialisation Portfolio manages the exchange programmes. The student exchange programme affords an opportunity for Unisa students to visit, learn, inspire and be inspired by their peers at other universities.

Students forming part of the delegation:

- Innovation Challenge winners
- Annual Student Research and Innovation Showcase winners



Unisa IP Policy

The University Council approved the Unisa IP policy in 2012 and it was revised in 2013. The policy deals with ownership and management of Intellectual Property (IP) that emanates from the publicly financed research and development activities as prescribed by the Intellectual Property Rights from Publicly Financed Research and Development Act 51 of 2008. The policy makes provision for the rights of IP creators to share in the benefits accruing from the commercialisation of any IP falling within the ambit of this policy.

Who does the IP policy apply to?

- All Unisa staff members (academic and support, and includes Professor Extraordinaire; Research Fellow; Honorary Professor; Emeritus Professor and Postdoctoral Fellows) irrespective of the type and duration of employment
- Postgraduate students
- Publicly financed research and development

What does the IP policy exclude?

- Undergraduate students
- Work undertaken in terms of 'Inside/Outside work' policy
- Outputs associated with conventional academic work e.g. a thesis, an article, a handbook, etc

Provisions relating to ownership of Intellectual Property

- Unisa owns IP created by Unisa staff except where the IP falls outside of the scope of employment
- Unisa owns IP created by registered postgraduate students undertaking research at the university and/or supervised or co-supervised by a Unisa staff member
- In the case of collaborative research projects, Unisa will consider joint ownership where the following requirements are met:
  - Joint IP creatorship, and
  - Contribution of resources, and
  - Conclusion of a benefit-sharing agreement, and
  - Conclusion of an agreement for the commercialisation of such IP.

Responsibilities of staff members

- Disclose any IP they have created to the DITTC (Directorate of Innovation, Technology Transfer and Commercialisation)
- Provide complete information in order to assist the DITTC to evaluate the disclosed IP
- Should it be decided that the IP warrants statutory protection, assist the DITTC by reviewing and completing appropriate forms
- Support the DITTC in attempts to commercialise the IP

Benefits of disclosing IP

- If the disclosure leads to a patent application, the IP creators receive a monetary incentive just for the disclosure.
- Where the IP is licensed, the IP creators are entitled to a share of any accruing benefits as follows:

  - ***First R1 million 20% of Gross Revenue***
    - IP creators then deduct allowable IP protection and commercialisation costs 40% of net revenue – Research entity 60% of net revenue – Unisa

  - ***Above R1 milliion***
    - Deduct allowable IP protection and commercialisation costs 30% of net revenue – IP creators 30% of net revenue – Research entity 40% of net revenue – Unisa

Innovation Walk

1. Intellectual Property (IP) disclosure evaluation

The IP creator completes an IP disclosure form

The IP creator completes an IP disclosure form. The IP disclosure form is very important for record and reporting purposes. It is a simple and confidential document wherein an IP creator discloses his/her IP and material circumstances surrounding the creation of such IP e.g. collaborators and their role, funding sources, etc.

DITTC processes the IP disclosure form

Once the DITTC receives the IP disclosure form, it shall send an acknowledgement of receipt not later than five days of receipt of the form. The disclosure form will be allocated a reference number, which will be used in all future communication regarding the disclosure. The DITTC will screen the completed disclosure form for completeness. The DITTC will assign the disclosure form to a Case Manager for further processing. The Case Manager will henceforth be the contact person regarding that particular disclosure.

DITTC arranges a meeting with the IP creator

The Case Manager will arrange a meeting with the IP creators in order to get more detail and clarity about the disclosed IP, its novelty and the problem it is directed at. In this meeting, the Case Manager will also interrogate, inter alia, issues relating to ownership of the IP, the funding used towards the creation of the IP, the contribution of the collaborators, and the contribution of the listed IP co-creators, and any third party rights that may encumber the IP.

DITTC evaluates the disclosure

The Case Manager will thereafter undertake a value proposition assessment to determine the following:

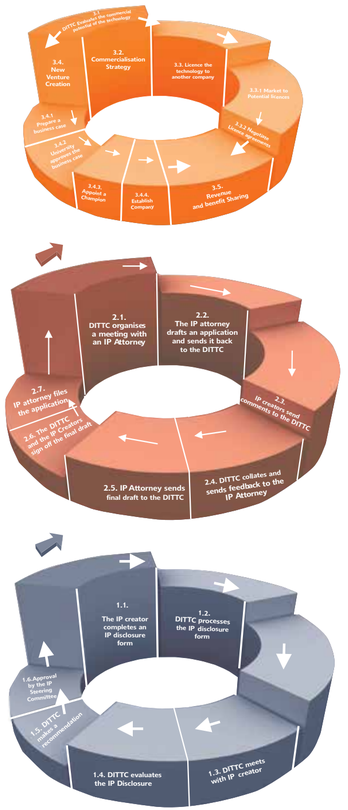
- Whether the IP disclosed is new or novel, and the appropriate protection route thereof. Towards this end, the Case Manager will undertake or solicit a novelty search and/or opinion.
- Stage of development of the technology, and the potential funding required for developing it further.
- The commercial potential of the disclosed IP and possible route to market for the disclosed IP.

The DITTC makes a recommendation

Based on its evaluation, the DITTC will make a recommendation to the IP Steering Committee on how the IP disclosed should be dealt with; protection and form of protection, whether in South Africa or in other Jurisdictions, etc. In support of its recommendation, the DITTC will submit to the IP Steering Committee such reports as may be necessary to support its recommendation and to enable the IP Steering Committee to take a decision. The IP steering Committee is an advisory structure created in terms of Section 7 of the Unisa IP Policy.

The IP Steering Committee takes a decision

- Protect the IP by filing a patent and/or design or plant breeders' rights application.
- Keep the IP Confidential.
- Not to protect the IP. In such instances, such IP has to be referred to NIPMO for a decision.



2. IP protection

DITTC organises a meeting with an IP Attorney

The DITTC will organise a meeting between an IP attorney and the IP creators where the IP will be discussed. This meeting is very important to enable the IP attorney to draft a properly informed application capturing the salient features of the IP sought to be protected.

The IP attorney drafts an application and sends it back to the DITTC

The IP attorney will send a draft application to the DITTC for review. The DITTC will forward the application to the IP creators for comments.

IP creators send comments to the DITTC

It is very critical that researchers provide their comments to ensure that the technology and its potential/foreseen applications, as well as the technical aspects are adequately and correctly described in the application.

DITTC collates and sends feedback to the IP Attorney

Depending on the extensiveness of the proposed change, additional meetings with the IP Attorney may be required.

IP Attorney sends final draft to the DITTC

The DITTC and the IP Creators sign off the final draft

The DITTC will only instruct the IP attorney to file the application with Companies and Intellectual Property Commission (CIPC) once the IP creators have indicated in writing that they are happy with the application.

IP attorney files the application

Once approval of the final application has been granted, the IP attorney will file the application with the CIPC.

3. Commercialisation

DITTC evaluates the commercial potential of the technology

The DITTC will undertake a detailed commercial opportunity assessment of the technology.

Commercialisation Strategy

There IP can be licensed to an existing or a new company or the University can create a company to exploit the IP.

Licence the technology to another company

If the most appropriate route to commercialisation is through licensing, the DITTC will prepare suitable marketing material for targeted potential licences.

A potentrial licence may propose any of the following:

a. BBBEE enterprises
b. Small and medium enterprises
c. Companies with local manufacturing capabilities

New Venture Creation

When the IP relates to a platform technology that offers options of creating multiple products, and which offers superior benefits over existing technologies, and where incumbents are not in a position to take on the new technology, then the University will consider creating a start-up company to exploit the IP. In such a case, the DITTC shall develop a business case for establishing a new company. The business case shall, after being endorsed by the IP Steering Committee, be approved by the University. The University can then identify from within or appoint a champion to lead the establishment, capitalisation and running of the new company.

Revenue collection and benefit sharing

The DITTC shall collect and distribute any revenue accruing from exploitation of University owned IP.

The revenue receipt by the University shall be distributed as prescribed in the IP Policy.

First R1 million

- 20% of Gross revenue – IP creators
- Then deduct allowable IP Protection and Commercialisation costs
- 40% of net Revenue – Research Entity
- 60% of net Revenue – Unisa

Above R1 million

- Deduct allowable IP Protection and Commercialisation costs
- 30% of net Revenue – IP creators
- 30% of net Revenue – Research Entity
- 40% of net Revenue – Unisa

Advocacy and Training Programmes

InnovationSense™

The DITTC offers workshops, training sessions, panel discussions and information sessions to staff and students through the **InnovationSense™ Programme**.

InnovationSense™ initiatives

1 Innovation, Intellectual Property and Commercialisation Workshops

These workshops aim to create awareness about innovation, intellectual property and commercialisation of intellectual property emanating from universities. These workshops provide participants with a broad understanding of innovation, understanding with regard to the type of intellectual property rights that are available and the possible routes which can be followed towards commercialising their intellectual property.

2 Training Sessions – Business Model Canvass

"From ideation to product in the market"

Training sessions focused on the Business Model Canvass are offered to staff and students over a seven-week period. The goal of the training is to equip participants who have innovative ideas and who are interested in starting up a business with the insight and tools that they can apply in the commercialisation of their product offering.

3 Innovation-in-Action Lecture Series

The Innovation-in-action lecture series is a platform where innovators and entrepreneurs are invited to give talks about their journey through the process of ideation to commercialisation. Included in this series are panel discussions on relevant topics that impact innovation.

Meet the DITTC Team

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