

Faculty Newsletter



Message from the Dean

Congratulations to everyone who has received their Ad Hominem promotion. This follows a vigorous process of assessing, not only performance in teaching, supervision research output, administration and leadership, but also participation in socially responsive activities. A big thank you to all the staff who were part of the working groups to assess the applications.

Applications for undergraduate study in 2021 closed on 31 August. We received 12 977 applications, which is 2034 more than last year. The Faculty Office has been busy making conditional offers to those who have submitted their June or September results. The final matric results are only expected out in mid-February so the first day of teaching will be 15 March 2021. On 30

September EBE participated in the University's Virtual Open Day which was aimed at applicants for 2021. It was an opportunity to answer questions and to let them know that we will be ready for them in March 2021.

With the announcement of Lockdown Level 1, we have a small group of additional research staff and postgraduate students returning to campus in Phase 4. Staff who are able to work from home will continue to do so. We need to remain vigilant and continue to adhere to all the COVID-19 protocols. We all need to play our part to ensure that we do not spread the virus.

Finalist for prestigious chemical engineering award

[Waste to Fuel Initiative](#), a collaborative project with a research team spanning three continents, is an IChemE Global Awards 2020 finalist in the Energy category. These awards celebrate chemical, process and biochemical excellence and are widely considered as the world's most prestigious chemical engineering awards. The Waste to Fuel Initiative contributes to the development of a modular technology to produce fuel from waste. Professor Eric Van Steen, the South African Reaction Engineering Research Chair in the Catalysis Institute, is one of the scientific group leading the project, and his PhD candidate, Chelsea Tucker, is the Waste to Fuel Initiative research co-ordinator. The other members of the group are Dr Ankur Bordoloi, senior scientist at the CSIR Indian Institute of Petroleum, Dr Dean H Barrett, joint researcher at the University of Witwatersrand (SA) and the National Centre for Energy and Materials Research (Brazil), and Dr Cristiane Barbieri



Photograph taken at the first workshop of the collaboration between UCT, the CSIR Indian Institute of Petroleum, India, and Laboratório Nacional de Luz Síncrotron, Brazil, which took place in 2018

Rodella, leader of the XPD Group at the Brazilian Synchrotron Light Laboratory. They are supported by a group of postgraduate students from UCT and India.

[Read the full story](#)

Substantial funding for HySA Catalysis project

Rhiyaad Mohamed, a researcher in the electrolyser group in HySA Catalysis in the Department of Chemical Engineering, has secured substantial funding from the German Federal Ministry of Education and Research (BMBF). The grant is in the range of €150 000 and will run for two years from August 2020. The project is in collaboration with Professor Richard Hanke-Rauschenbach and his group at the [Institute for Electric Power Systems](#) at Leibniz University in Hanover. HyPlat (UCT spin-out company) is also involved in the project as the commercial partner.



The BMBF's Africa strategy aims to strengthen the networking of science and industry in order to

increase the application orientation of research and exploitation of research results and thus support economic development in Africa.

The project title is Reaction kinetic improvements by using novel catalyst layers for PEM water electrolysis. The ultimate goal of this proposal is to familiarise the African partners with the principle of contract research through the acceleration of proton exchange membrane (PEM) water electrolyser catalyst coated membrane (CCM) technologies towards commercialisation.

[Read the full story](#)

Engineering for People Design Challenge

CHE1005W (Chemical Engineering I course) in the Block 2 project this year partnered with Engineers Without Borders South Africa in the 2020 Engineering for People Design Challenge. Students were tasked to come up with engineering solutions for a community called Makers Valley in Johannesburg (specifically in the challenge area of water and sanitation for our cohort). This design challenge is a collaboration between three Engineers Without Borders organisations - South Africa, UK and USA. Students in the UK, Ireland, South Africa and the USA are taking part in this challenge.

The award-winning Engineering for People design challenge prepares the engineers of the future to be globally and socially responsible. This design challenge is integrated into undergraduate

courses and allows students to explore the ethical, environmental, social and cultural aspects of engineering design. It also gives them practice in using their skills and knowledge to benefit people and planet.

The top five submissions from the first-year class were selected and forwarded to the EWB-SA team. Naseeba Abbas, the lecturer for the project, said, "Congratulations to the following students that have made it to the next round." They are:

- 1) Emma Crowther
- 2) Joshua Elliot
- 3) Noor Hassan
- 4) Rana Ebrahim
- 5) Thomas Neff

The students have been asked to create a PowerPoint presentation and video clip for the EWB-SA



judging panel by mid-October. From these submissions, the EWB-SA judging panel will select the top two submissions, which will be entered into the Grand Final (happening virtually and date TBA closer to the end of the year). The two students that make it to the Grand Final will compete with other students from other universities across the country as well as in the USA and UK.

Find out more [here](#).

Ad Hominem promotions

Research Officer to Senior Research Officer



Dr Rhiyaad Mohamed from HySA Catalysis in the Department of Chemical Engineering.

Lecturer to Senior Lecturer

Dr Elaine Opitz from the Department of Chemical Engineering



Senior Lecturer to Associate Professor



- Dr Malebogo Ngoepe from the Department of Mechanical Engineering
- Dr Patroba Odera from the Division of Geomatics



- Dr Amir Patel from the Department of Electrical Engineering
- Dr Dyllon Randall from the Department of Civil Engineering

Associate Professor to Professor

- A/Prof Jenny Whittal from the Division of Geomatics
- A/Prof Abimbola Windapo from the Department of Construction Economics and Management.



Exploring Post Covid-19 Property Trends in South Africa

In August, Professor Francois Viruly from the Urban Real Estate Research Unit (URERU) in the Department of Construction Economics and Management hosted a webinar on Exploring Post Covid-19 Property Trends in South Africa.

He looked at the longer-term trends in the country's property market and the impact that the pandemic is expected to have on the sector.

"Many of these trends are not 2020 or COVID-19 trends, but actually trends that have been in the property market for a number of years," he explained, adding that COVID-19 would invariably have an impact.

The trends Viruly predicted during the webinar included changes to where and how we shop, the growing importance of the environment, the organisation of work, the evolution of central business districts and the role of technology in facilitating property transactions.

[Read More](#)



UCT researchers selected for global climate change report

The United Nations' (UN) Intergovernmental Panel on Climate Change (IPCC) recently appointed two researchers from the University of Cape Town to join an international team to write and review its Synthesis Report for the Sixth Assessment Report (AR6 SYR).

The IPCC is the UN body that assesses the science related to climate change, and the AR6 SYR is a document that integrates all the IPCC's reports in the sixth assessment cycle.

Professor Harald Winkler and Dr Christopher Trisos – both associates of the African Climate & Development Initiative, with Winkler based in UCT's Faculty of Engineering & the Built Environment – join 30 authors and nine review editors from around the world to form the core writing team (CWT).

The appointment of Winkler and Trisos to the CWT is evidence of the calibre of climate-change research at UCT. Both researchers said they were looking forward to making this high-level contribution.

"I am excited to be invited to join a small group of scientists on the CWT from among the hundreds of authors who have been involved in the AR6 cycle. Synthesis for me is about looking at the big picture," said Winkler.

Trisos added: "We're facing a climate-change emergency. So to me being selected means a lot of responsibility and a lot of work to get it right."



Dr Christopher Trisos (left) and Prof Harald Winkler (right) are both associates of UCT's African Climate & Development Initiative. Photos Andrea Koris / Supplied.

Before the CWT is appointed, authors are nominated by their respective governments for one of the IPCC's Working Groups (WGs) or Special Reports. The three IPCC WGs are:

- WGI, which assesses the physical scientific basis of the climate system and climate change
- WGII, which assesses the impacts of climate change on humans and ecosystems, the vulnerability of these systems to climate change and options for adapting to it
- WGIII, which focuses on climate-change mitigation, assessing methods for reducing greenhouse gas emissions and removing greenhouse gases from the atmosphere.

[Read More](#)

Mail & Guardian Top 200

Entrepreneurship category

Farirai Sanyika, 2014 Chemical Engineering graduate

As a chemical engineering graduate, Farirai Sanyika found her success as a travel entrepreneur a surprise — even to herself. But since kicking off the Gophari travel blog in 2017, Sanyika hasn't looked back. The travel blogger's post-graduation trip to Mauritius sparked her travel obsession. While working and living in the small industrial town of Secunda, Sanyika discovered the beauty of Mpumalanga and has since loved exploring South Africa. Through Gophari, Sanyika showcases South Africa, encouraging travellers to explore the country's hidden gems.



Science and Technology category

Thapelo Nthite Electrical Engineering master's student and chair of the EBE postgraduate student council



“Only 18% of the South African population speaks English at home. It is clear that English is the primary language of instruction and trade, not of understanding! The issue is that almost all digital services are offered in English, making them inaccessible to the majority of the country.”

The way Thapelo Nthite describes the differences between spoken and understood language, and structural, transactional vernacular makes it feel a tad bit churlish to describe Botlhale Artificial Intelligence as filling a gap in the market.

Botlhale is an Artificial Intelligence company that aims to increase the application of AI systems in South Africa, and the motivation driving their young co-founder and chief executive is simple: to eliminate language as a barrier to entry for basic digital services.

Nthite points out, “Although there has been a lot of research done in human language technology systems for South African languages, there is still a lack of practical implementation of these systems. We are still far behind in this space, which means that people who speak South African languages are missing out on new technologies that could aid and simplify their lives.”

Mail & Guardian Top 200

Civil society category

Ian Mangenga, honours landscape architecture student



Ian Mangenga is the founder and designer of the digital hub Digital Girl Africa. She wants to see more women entrepreneurs running businesses online, more content created by women for women and women having an equal stake in the digital economy. She pushes that agenda by educating and connecting young African women in tech. Mangenga holds a BSc in geography and archaeology from the University of the Witwatersrand, and is pursuing honours in landscape architecture at the University of Cape Town.

Initially, she wanted to study landscape architecture, but getting to learn technical spatial design skills after having gone the social sciences and social justice route has added dimension to her design perspective.

Environment category

Shaakira Chohan, 2010 MArch (Prof) graduate

Architect and urbanist Shaakira Chohan says one of the proudest moments in her career so far was being part of the team that erected the statue of Nelson Mandela in Palestine. She led the team that designed, erected and unveiled the statue, which is now in the Palestinian city of Ramallah.

Being part of the team also allowed her to understand the power of making an impact on people's lives in unexpected ways without any expectation of return. It is this ethos that inspires her work. Chohan said she wants to see more considered, human-centred environments in cities that provide safety, healing, opportunity and inspiration for their inhabitants. Through her work as an architect and urbanist, she hopes to see marginalised communities being allowed to participate in their neighbourhoods and cities to create a more equitable society.

The personal and the public are very close to each other for Chohan. How she treats people in her life is how she approaches her work. "My passion is making the world a better place for someone else — whether that is through showing up for a loved one or working on my career, I am driven by the ability to give and uplift, most



especially to anyone that is in need," she says.

Chohan is a Mandela Washington Fellow as part of the Young African Leaders Initiative. She's a TEDx speaker, and a previous finalist for the Pioneer in Innovation for Women in Construction Award, and won a Standard Bank Rising Star Award. She wants not only to improve herself but also to ensure she shares all she knows, especially regarding developing emotional intelligence.


Architecture students pay it forward

A special collection of drawings featuring the communities of Imizamo Yethu in Hout Bay and Langa on the Cape Flats, sketched by a group of honours students in the School of Architecture Planning & Geomatics (APG) at the University of Cape Town is up for sale at The Architect Gallery at the Cape Institute for Architecture. All proceeds will go towards non-profit organisations providing social-relief measures to both communities.

The exhibition is based on previous work by two honours studio electives – Studio Glocal, which focused on Imizamo Yethu, and City of Houses, which focused on Langa. According to Michael Louw, a senior lecturer in the School of APG, when the COVID-19 pandemic reached South Africa’s shores, it was necessary to reach out to support both communities to mitigate the effects of the pandemic and the subsequent lockdown.

“Very quickly we became aware of food shortages in both communities and we wanted to help in any shape or form,” he said.

[Read More](#)



71 Hout Street
The Cape Institute for Architecture

Imizamo Yethu and Langa
fundraising exhibition opening 3 August 2020

This is an exhibition of work that was donated by students of the University of Cape Town's department of Architecture, Planning and Geomatics. The works formed part of their site analyses and project proposals for the Studio Glocal and City of Houses design electives in the BA(Hons) programme. These studio sites of investigation this year were Imizamo Yethu and Langa.

The works are either originals or limited-edition prints, which were all framed by hand by John Coetzee, using natural Beech wood.

The shows are all for sale at R750.00 each (framed). All proceeds will go to food relief in Imizamo Yethu and Langa. The works are on display physically at the Cape Institute for Architecture gallery, The Archibank at 71 Hout Street, Cape Town (Covid-19 protocols apply), but they are also available for viewing on the Institute's website www.cia.uct.ac.za.

Works can be purchased in the venue or online, and they may be collected at the end of August (or purchasers can make their own courier arrangements).

With thanks:
Students who donated their work: Annie Boschhoff, Andre Coetzee, Carol Coetzee, Shazia Ebrahim, Aalia Handberg, Nathan Ebers, Asha Hanweke, Lulu Hoon, Kaitlin Jones, Liam Luytens, Mathew Murré, Tasha Myles, Camilla McCormick, Savannah Muller, Sheryl Mungai, Rebecca Parker, Wayne Parker, Goroeba Shuter, Shwanish Smith, George Strydom, Fana Thutse, Devon Voo.

Studio elective leads: Michael Louw and Sorin Spamer
Teaching assistants: Myrnell Ramasar and Sebastian Hitchcock
Organiser: Michael Louw
Framing: John Coetzee
Poster design: Nathan Eison
Installation: Kaitlin Jones, Camilla McCormick and Devon Vos
Hosting: The Cape Institute for Architecture
Funding: Michael Louw and Sorin Spamer

Funding and donations: Baltic Timbers, Cape Institute for Architecture, Dickie Edge, and University of Cape Town Project Grant funding.

Introduction to land administration

During lockdown, Dr Simon Hull from Geomatics was busy developing educational material for an NGO, [LandNNEs](#), for a series titled [An Introduction to Land Administration](#). It is a 17-part series which takes viewers through the basic concepts of land administration. It is aimed at ‘beginners’ with little or no prior experience in the land-administration sector, but seasoned professionals might find the insights useful too. Simon was supported in this by Dr Rosalie Kingwill of UWC PLAAS and Tshepo Fokane of the Alliance for Rural Democracy. They compiled comprehensive notes on land administration, the link to which can be found in the video descriptions.

The hope is that they will be widely watched by NGOs, the government, students, academics, and anyone involved or interested in all things land-related.

[Read more](#)



Falling Walls lab 2020

On 22 September, Falling Walls Lab together with UCT hosted an online event where students, early-career researchers and academics were invited to pitch their innovative idea in just three minutes, showcasing a breakthrough that creates a positive impact on science and society.

The winners this year are:



Chelsea Tucker

First prize (R15 000) **Sandile Zakwe** – Breaking the Wall of Poor Healthcare Service

Second Prize (R10 000) **Chelsea Tucker**, PhD candidate in the Department of Chemical Engineering. Her talk's title was Breaking the Wall of Energy Insecurity in Sub-Saharan Africa and focused on her doctoral research on the design of an off-grid, modular waste-to-fuel unit.

Third Prize (R7 000) **Athena Strauss** who is a master's student in the Department of Chemical Engineering. Her talk's title was Breaking the Wall of Electronic Waste.

Chelsea and Sandile now have the opportunity to present their ideas to a prestigious international audience at the Berlin finale, which will be held online.

Best paper award for Engineering Education

Phelokazi Nnodana, a master's student in Engineering Education in the Department of Mechanical Engineering, received the best-paper award at the European Society of Engineering Educators conference which took place online from 20 to 24 September. The annual conference is a scientific conference focused on Engineering Education and is the biggest event of this type in Europe. The organisers received 182 papers and workshop proposals.

The title of Nnodana's paper is *Engineering Identity in the South African Context*. She is co-supervised by Dr Corrinne Shaw and Dr Bruce Kloot.



Fellow of the African Academy of Sciences

Professor Harald Winkler has been elected as a Fellow of the African Academy of Sciences (ASS) for the outstanding contribution he has made in his field of expertise, both regionally and globally, and for having attained the highest international standard in his work.

Professor Himla Soodyall, executive officer of the Academy of Science of South Africa, said, "Your election is well-deserved and indeed an honour for South Africa."

Professor Winkler said it was an honour that one of his gurus, Youba Sokona, the vice-president of the Intergovernmental Panel on Climate Change had nominated him.



New staff

Miss Nikita Bam joined the Crystallisation and Precipitation Unit on 1 July as the Research Admin Officer.

Miss Nasheeta Hanief joined the Electron Microscope Unit on 1 September as the Chief Scientific Officer.

Mr Theo Harding joined the Department of Civil Engineering on 1 September as a Lecturer.

Mr Arnold Pretorius joined the Department of Mechanical Engineering on 1 August as a Lecturer.

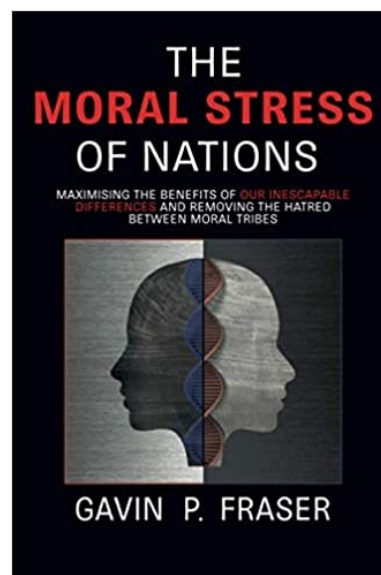
Mr Naadir Daniels joined the Faculty finance section from 1 August as the Assistant Finance Manager.

Mr Jamie-Lee Swarts joined the Faculty Office on 1 September as the EBE Postgraduate Admin Assistant.

Mr Vinesh Dhevcharran will join the Faculty on 16 October as the IT and Facilities Manager.

Congratulations

Gavin Fraser, a 1980 chemical engineering graduate, published a book, "[The Moral Stress of Nations](#)," on Amazon. It has reached no.3 in worldwide bestsellers for books about Colonialism & Post Colonialism.



Celebrating Heritage Day

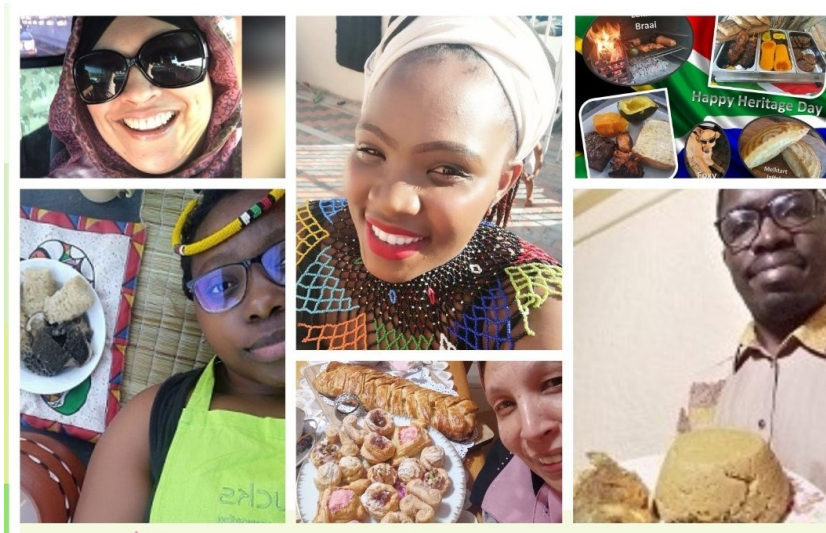
The EBE Transformation committee invited staff and students to participate in a competition to celebrate heritage month. The categories to enter into were:

- Cultural dishes (main/desserts)
- Cultural clothing
- Cultural dance

To enter you had to take a photograph with you and your cultural dish or wearing your cultural outfit, or a video clip of your dance.

The selection panel selected the following winners, who will each receive a R250 Woolworths voucher.

- Noah Katsiru - Electrical Engineering postgrad student with a Zimbabwean cultural dish
- Angus Rule - Civil Engineering staff with a South African Braai cultural dish
- Shireen Govender - Chemical Engineering staff with South African Desserts
- Ayesha Dilwai - Civil Engineering staff with Indian Cheese & Corn Samosas
- Nomsa Gamede - Chemical Engineering undergrad student with a Zulu cultural dish
- Lumka Johannes - EBE Faculty postgrad section with Zulu cultural dishes



Electrical Engineers develop COVID-19 tool

During this time of COVID-19, the need for a complex multi-tool that was simple both to create and to use was identified to help stop the spread of COVID-19 in shared public spaces, especially those in communal township areas such as shared taps and door handles.

A key application of innovation by the principal investigators, Dr David Oyedokun from the Department of Electrical Engineering and Kai Goodall, an electrical engineering master's student, towards fighting COVID-19 was identified.

A project named Tool for COVID-19 Spread Prevention was funded by the IEEE Humanitarian Activities Committee and the Special Interest Group on Humanitarian Technology. 2 500 units will be 3D printed with PLA Filament, which is 100% biodegradable, to make the project sustainable. The tools will be donated to township communities throughout South Africa.



The TDO multi-tool can be used to open different taps and door handles without the user touching any of the shared surfaces that could be infected with COVID-19. The target market for the tool is anyone that interacts with a shared public tap or door. The device is not a replacement for hand sanitisers or other COVID-19 spread-prevention guidelines and should be used in



Mr Owen Ntsasa, the Director of the Khayelitsha Metropolitan Police, a community elder, Kai Goodall and Dr David Oyedokun with a box of the tools to be donated.

conjunction with other preventative measures.

Features and design aspects of the tool include:

- a protective cover which conceals the device before and after use to reduce accidental contact whilst it is not in use with the active part, which may be contaminated
- a protective barrier between the safe passive device handle and the potentially infected active part of the tool to prevent the user from accidentally touching the unsafe active part of the tool

The tool has an ergonomic user handle with a thumb indent for added grip support.

Community collaboration is a vital component of IEEE projects of this nature. On Monday 14 September 2020, Oyedokun and Goodall donated the first batch to

the Khayelitsha Metro Police Station which agreed to be the distribution hub, as this would help instil confidence in the community to use the tool.

Two community elders facilitated as translators to the isiXhosa-speaking community members, and explained the workings and need for the TDO multi-tool. Mr Owen Ntsasa, the Director of the Khayelitsha Metropolitan Police, was very impressed by the tool and firmly believed that the tool would make a positive impact on the local community during this challenging time of COVID-19. He was also very honoured that Khayelitsha was chosen as the first community for the donation of the tools. Seventy units were donated to the metro police station to equip their members with the TDO multi-tool, and an additional 100 units were handed out to community members.

Electrical Engineers develop COVID-19 tool

Mr Ntsas mentioned that working with the community forms part of their job, and they were happy to work with members from UCT and IEEE on this project. He said, "This tool will be very useful in our community, especially with the elderly. I am very happy that you considered working with this Metro Police department to bring this tool to the community we serve. I like the tool. I find it very light and easy to use."

A further donation of about 1 800 TDO multi-tool units is expected over the next few weeks, with educational videos and taps for demo being presented to educate the community on the use of the tool.

Oyedokun and Goodall designed and developed the TDO Multi-tool with the assistance of Ben Bramwell,

the 3D printing technician of the project and operator of the 3D printing farm which produces the tools. Oyedokun said, "We are grateful to the IEEE Humanitarian Activities Committee and the Special Interest Group on Humanitarian Technology for funding the project. And the Department of Electrical Engineering at UCT for contributing generously to the project by augmenting the 3D printing capacity with eight 3D printers."

A team of UCT IEEE young professionals, led by Dr Hilary Chisepo, is managing the logistics needed for the mass distribution of the tool, as well as creating a survey to gauge the impact of the tool within the Khayelitsha community.



Kai Goodall and Dr David Oyedokun handing out the TDO multi-tools

Oyedokun added, "A spin-off from this project is the exposure of high school learners to 3D printing technology, engineering design and how innovation can be brought to life. We hope this will provide the space to allow these students to create solutions to their community's needs, develop and sustain interest in engineering."

Diseased livestock: infrared system's early warning

Like humans, animals are threatened by deadly pandemics that spread quickly and, in the case of commercial livestock, decimate herds and flocks. But an inexpensive early warning diagnostic tool developed by Professor Amit Mishra from the Department of Electrical Engineering and start-up company 3DIMO holds hope for small - and medium-scale livestock farmers, many of whom are black women.

The Thola infrared imaging tool is being developed by local black economic empowerment start-up company 3DIMO. It is in the final stages of phase one of a pilot project involving several emerging farmers in Thaba

'Nchu in the Free State.

A basic infrared camera (around one third of the size of a smartphone) can be mounted on a smartphone or, for larger areas and numbers, the images can be taken using bigger infrared cameras mounted on drones.

The infrared camera measures the heat signature of each point of the animal in the field of view. This provides useful information; for example, a higher temperature on a foreleg could signal inflammation or some other malaise.

"Different diseases have different signatures," said Professor Mishra. "Not all diseases are detectable, but



the temperature of the hoofs, and some other parts of the animals, for example, has been shown to be very useful in detecting common diseases like foot-and-mouth disease."

[Read more](#)