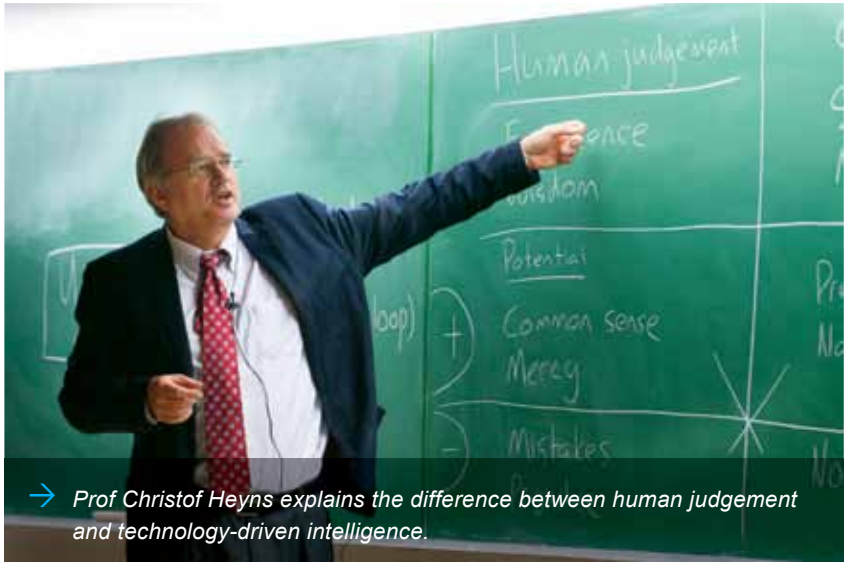
# Lethal autonomous robotics: Coming to a theatre near you?

**The use of drones (unmanned armed vehicles) by the United States government against targets in northwest Pakistan along the Afghanistan border since 2004 has brought the technical, ethical and legal aspects of lethal autonomous robotics under the spotlight. This was also the topic under discussion at the annual Hendrik van der Bijl Memorial lecture, presented on 14 August 2013 by the University of Pretoria and the South African Academy of Engineering (SAAE).**




*Prof Christof Heyns explains the difference between human judgement and technology-driven intelligence.*

The guest speaker, Prof Christof Heyns, is pre-eminently qualified to consider this subject, as United Nations Special Rapporteur on Extrajudicial, Summary or Arbitrary Executions, professor of Human Rights Law at the University of Pretoria, and Co-director of the Institute for International and Comparative Law in Africa (ICLA).

Prof Heyns explained the distinction between the two different kinds of unmanned systems. In the case of drones, although the armed vehicle itself is unmanned, it has a human operator via remote control. However, in the case of lethal autonomous robots (LARs), human beings are out of the loop; an onboard computer takes the decision to deploy the force.

LARs are weapon delivery systems that, once activated, can select and engage human targets without further intervention by a human operator. LARs were developed with a number of advantages in mind, including the protection of one's own people. In addition, one can achieve more with fewer people, and one is able to eliminate the weakest link (the human factor) and achieve results faster.

The general concern with the use of LARs, however, is that we may be overestimating the abilities of computers. Other specific concerns that need to be considered include the fact that using LARs might make it easier to go to war. With LARs, there is also an uncertain legal responsibility in terms of who is actually responsible for wartime deaths. In this respect, LARs may not comply with the prescripts of International Humanitarian Law. While LARs may be used outside armed conflict situations, there are implications for states without LARs. The actual legal-ethical complexity comes in when one takes human decision-making out of the equation in armed conflict, and many questions related to humanitarian

> Ultimately, the dilemma is an ethical one that revolves around decisions regarding the right to life.

and other issues arise, such as the psychological effects of distance killing, and the effect of a war without valour, in which there is no direct engagement.

Prof Heyns concluded his presentation by weighing up the pros and cons of human judgement vs. computers. While human judgement has the advantage of experience, wisdom and qualitative evaluation, computers have the advantage of statistics, algorithms and quantitative evaluation. While human judgement has the benefit of common sense, mercy and compassion, human beings also make mistakes, can be prejudiced, and may commit crimes. Computers, on the other hand are precise and fast, and have no fear of revenge. However, computers do not have the benefit of common sense and compassion.

The Hendrik van der Bijl Memorial Lecture is an annual event that is presented jointly by the University's Faculty of Engineering, the Built Environment and Information Technology and the SAAE. It is delivered by a prominent personality under the general theme of the role of engineering in society. This lecture is of particular significance to both the University of Pretoria and the SAAE, as Dr Van der Bijl was the Chancellor of UP from 1934 to 1948 and he made a huge contribution to the industrial and scientific development of South Africa. The first Hendrik van der Bijl Memorial Lecture was delivered in 1963 by Dr MS Louw (who represented Sanlam), and ever since, these lectures have been delivered by eminent personalities who have made their mark in South Africa.

## More on Hendrik van der Bijl

Hendrik van der Bijl was born in Pretoria in 1887 and attended school in the Cape Province during the Anglo Boer War. After studying at the Victoria College (which would become the University of Stellenbosch), he continued his studies overseas, specialising in electronics. He was working for the American Telegraph and Telephone Co. in New York as part of a selected group of research scientists that spearheaded American technological development when General Jan Smuts requested him to return to South Africa.


*Prof Bob Pullen, President of the South African Academy of Engineering (SAAE), introduces Prof Christof Heyns as the guest speaker at the annual Hendrik van der Bijl Memorial Lecture.*

In 1920, he joined the South African government as Technical Advisor, and laid the foundations for the development of South African industry. He established and became the Chairperson of Eskom, Iscor and the Industrial Development Corporation.

The outstanding organising ability and leadership qualities he displayed during the Second World War enabled him to use this opportunity to stimulate and facilitate the second stage of rapid industrial development in South Africa. In later years, Dr Van der Bijl turned his attention to the private sector of the economy. One outcome of this was the establishment in 1947 of Safmarine, of which he was the first Chairperson.

The foundations for the industrial development of South Africa were laid by Hendrik van der Bijl, the scientist, industrial leader, engineer and entrepreneur. His achievements have been recognised internationally and locally. He was elected a Fellow of the Royal Society and he received honorary degrees from both the University of Stellenbosch and the University of the Witwatersrand. Vanderbijlpark was named after him.