

# A more focused look at skin

## A full body scanner is simplifying the early detection of skin cancer

Researching doctors and medical technicians in Magdeburg have developed a device that has brought the early detection of skin cancer a major step forwards: the full body scanner is set to simplify the work of dermatologists and provide a more reliable form of skin screening. In April, the development team, which was recently awarded the Hugo Junkers Award for innovation by the federal state of Saxony-Anhalt, is to present the device at the World Congress for Dermatology in Vienna, where it seems certain to win the approval of the professional world.

It was fifteen years ago that Professor Dr Harald Gollnick, Director of the Magdeburg University Clinic for Dermatology and Venereology, had the idea of developing a skin scanner. He knew from practical experience, after all, that the previous straightforward clinical examinations with a well-versed eye and a dermatoscope are very time-consuming, but that large numbers of moles are also laborious to document and their long term monitoring is not especially reliable. Senior Physician Dr Daniela Göppner explains: "If a patient has more than a hundred moles, then on the one hand it is difficult to make sure that you don't miss anything. On the other hand, the next time the doctor sees the patient, it is also necessary to be able to ascertain which moles have changed in terms of their size, texture or colour. It is necessary to find exactly the same places and the same moles." Until recently, the doctor would examine the skin using a dermatoscope. They would then make a sketch of which changes to the skin were evident and needed observation.

This, however, is where the full body scanner is now stepping in. In 2001, with his team of doctors and the Magdeburg Fraunhofer Institute IFF, Prof Dr Harald Gollnick launched the "DermaScan" research project, the goal of which was to develop a hardware and software programme that is able to ascertain dermatological changes quickly and reliably, and prepares the data so that they can be used for a subsequent comparison. Together with the Magdeburg-based medical technology firms Hasomed and Dornheim Medical Images, the doctors, medical technicians and data processing professionals set to work on this challenge.

The result, the prototype of the dermatological full body scanner, is now in use at the Magdeburg University Clinic for Dermatology and Venereology. The device is able to scan 90 percent of the surface of the patient's skin; it is only a patient's intimate areas, scalp and the soles of their feet need to be examined separately by the doctor. At first glance it looks a little like a shower cabin. The patient stands on a rotary table naked. Their skin is illuminated optimally so that every individual mole is clearly recognisable on the images. The rotary table begins to turn and several digital cameras photograph the patient's skin from differing positions. "We then create a true to scale image of the person's skin on the computer which enables the doctor to find a specific mole one year later," explains Dr Dirk Berndt, leader of the business field of Measurement and Testing Technology at the Fraunhofer Institute IFF in Magdeburg. "The position of the cameras and ensuring a diffusion of light that approximates to daylight are important."

High resolution image data then results on the basis of which the doctor is able to evaluate, assess and compare the colouration, irregularities and size of the moles against the previous data. "With this full body scanner, a standardised assessment of the state and any changes to the skin is now possible for the first time," explains Dr Daniela Göppner. This semi-automatic assistance system reduces the time spend on the examination and documentation for the doctor. "The scanner relieves the work of the dermatologist – but it doesn't replace it," highlights Dr Daniela Göppner.

Putting innovation and money into superior dermatological diagnosis is important and necessary, since with malignant melanoma for example, which is the black form of skin cancer, the chances of recovery are only good in the early stages. In recent decades, it isn't just doctors in Magdeburg who have recorded an increase in diagnoses of skin cancer. Incidences of skin cancer are increasing all over the world. It is also worrying that the risk of illness has increased amongst younger patients. "This is being caused by excessive exposure to UV radiation during leisure hours and holidays and the senseless use of solariums," explains Prof Dr Harald Gollnick.

In Germany, those enrolled in health insurance schemes and who are aged 35 or over have the legal right to an early detection screening examination for skin cancer, which is also known as "skin cancer screening". This is generally carried out by a dermatologist and supported by specially trained general practitioners. It is unlikely, however, that every dermatologist will be able to avail of a full body scanner in their practise in the foreseeable future. "It is a sophisticated, expensive technology – it is possible to imagine it as being a computerised tomography for the skin. Realistically, once it has reached market maturity, we can expect the scanner to go into use in specialist practices and clinics," highlights Dr Daniela Göppner. The project partners are aware that it will take some time before this is achieved. "The medical benefits of reliable early detection by the full body scanner have to be proven so that the health insurance schemes can carry the costs of the medical examinations." To this end, in the next step, some studies will be required. It goes without saying that the doctors and engineers in Magdeburg can be very proud of their forward looking development, however. They certainly deserved to be awarded the Hugo Junkers Prize for Research and Innovation from Saxony-Anhalt last year. And at the World Congress for Dermatology in Vienna from 16th until 18th April they will show the world the spirit of research that the finest minds in Saxony-Anhalt can offer.

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