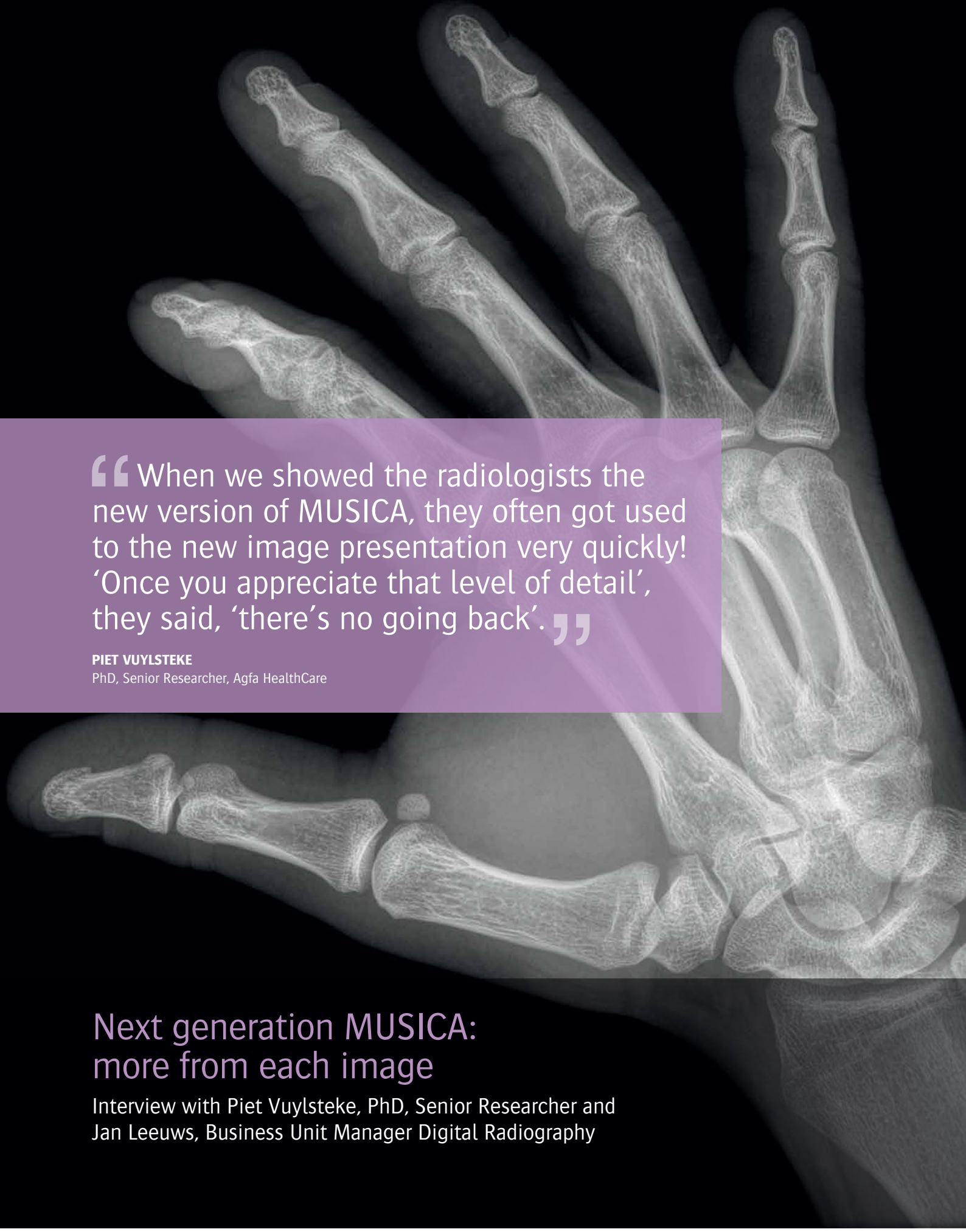


> “When we showed the radiologists the new version of MUSICA, they often got used to the new image presentation very quickly! ‘Once you appreciate that level of detail’, they said, ‘there’s no going back’.”

PIET VUYLSTEKE
PhD, Senior Researcher, Agfa HealthCare

Next generation MUSICA: more from each image

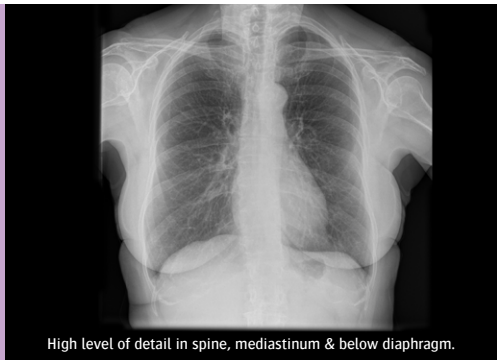
Interview with Piet Vuylsteke, PhD, Senior Researcher and Jan Leeuws, Business Unit Manager Digital Radiography

AGFA HealthCare

Next generation MUSICA*: more from each image

Interview with PIET VUYLSTEKE, PhD, Senior Researcher and JAN LEEUWS, Business Unit Manager Digital Radiography
Agfa HealthCare

> “With MUSICA, we get more details out of an image, and in a more comfortable way.”
>
> **JAN LEEUWS**
> Business Unit Manager Digital Radiography



High level of detail in spine, mediastinum & below diaphragm.

The introduction of MUSICA image processing software was a true technological breakthrough, offering automated, exam-independent digital image processing using contrast enhancement founded on multiscale mathematics. Now our next generation MUSICA, with its own technology advances including Fractional Multiscale Processing, takes us and our customers another big step forward.

Next generation MUSICA will soon be available for all of our CR and DR systems. Jan Leeuws and Piet Vuylsteke from Agfa HealthCare sat down to explain the technology behind it, and what it means for radiologists and other clinicians.

Consistently high image quality across all exams

“We developed the new version of MUSICA based on our commitment to enhancing imaging quality and in close collaboration with our customers. This launch keeps us in the forefront of technology, and allows us to continue meeting the evolving imaging needs of the healthcare sector, resulting from factors such as the ever-increasing success of our digital imaging systems,” explains Piet Vuylsteke, PhD, Senior Researcher.

It’s important to understand that the next generation MUSICA still offers all the benefits of previous generations, say the interviewees. “MUSICA is fully automatic, very easy to use and install, and gets maximum information from a clinical image, independent of the patient’s body size (adult, child or infant; slim up to obese) or of the exam type,” comments Jan Leeuws, Business Unit Manager Digital Radiography. “There is no need to configure the image processing parameters for each exam, and the technologist doesn’t need to apply specific settings for each exam type and exposure technique. That hasn’t changed.”

Neither has our MUltiScale Image Contrast Amplification (MUSICA) mathematical principle. Developed in the 1990s, it has proven since then to be the most successful image processing technology for digital X-rays. “Our challenge is to take the best and make it even better! One of our key design goals was to let the users obtain consistently high image quality across all exams and all patients at all hospitals, while applying a minimal radiation dose.”

In the forefront of technology

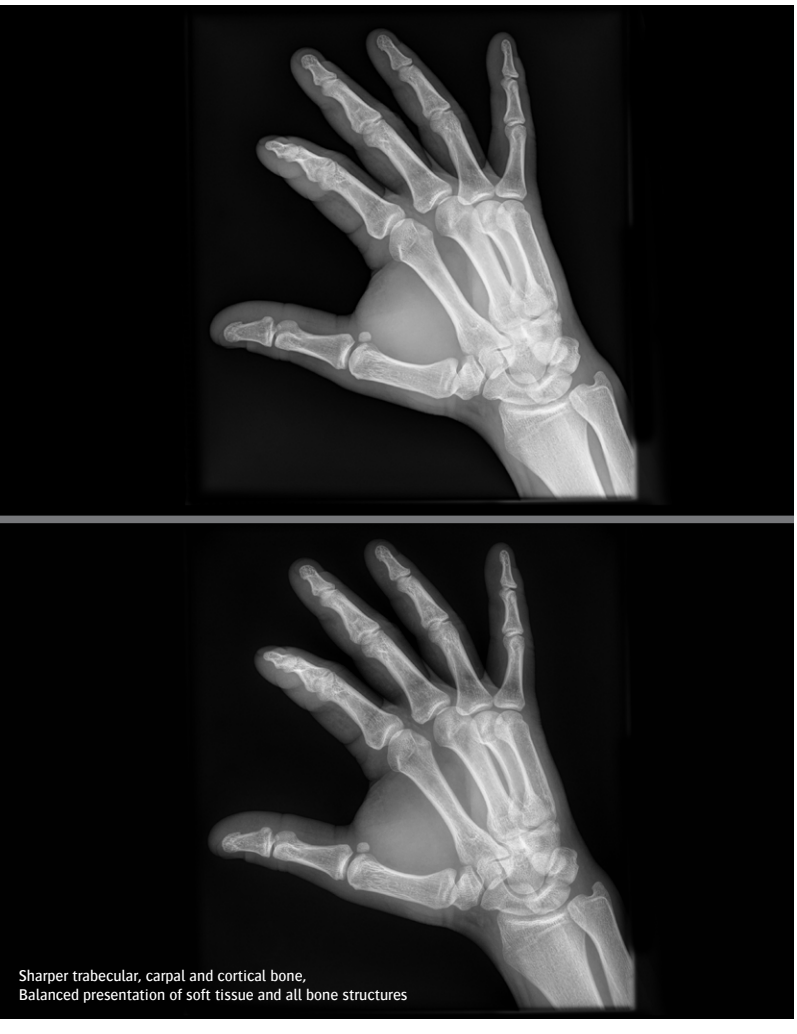
To address this challenge, we have made some fundamental changes to the system’s substructure. “In order to nicely render the most difficult zones of an image, such as the abrupt transitions from low to high density areas, we have applied a new mathematical algorithm, called Fractional Multiscale Processing (FMP). With this algorithm, the image processing filters are further decomposed to elementary fractions, which are processed separately. As a result, we can represent the grayscale differences in a more natural way, without artifacts,” explains Piet Vuylsteke. FMP also eliminates the need for window level adjustment to enhance visibility of details.

Several additional improvements have been made in the mechanisms that adapt the contrast, noise and grayscale of the images. In general, the images are more homogeneous and pleasant to look at for the radiologist, as well as being enhanced and represented in a very consistent way. Another advantage of the next generation MUSICA is that it is even easier to install.

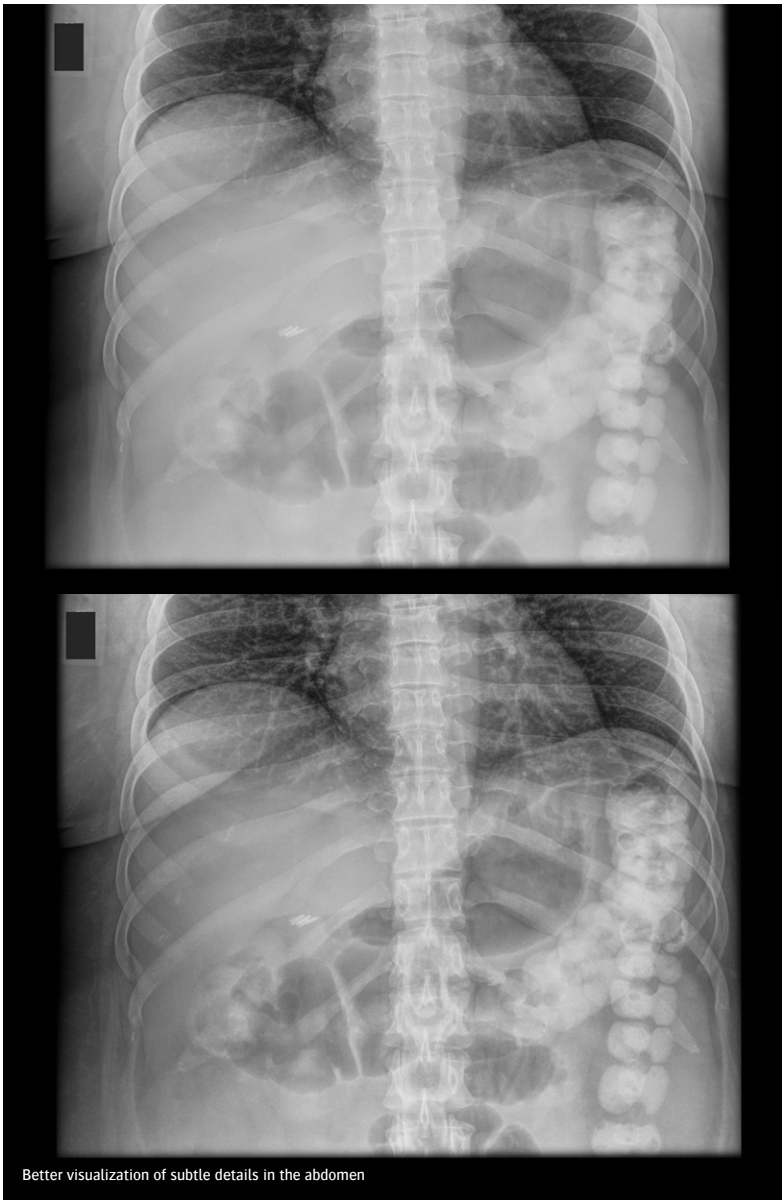
* Work in Progress

“Subtle bone details often tend to fade in the vicinity of implant edges, but with the next generation MUSICA, these details are well preserved and easily visible. I compare it to being able to hear a pianissimo passage after an explosion.”

PIET VUYLSTEKE



Sharper trabecular, carpal and cortical bone,
Balanced presentation of soft tissue and all bone structures



Better visualization of subtle details in the abdomen

“MUSICA is fully automatic, very easy to use and install, and gets maximum information from a clinical image, independent of the patient’s body size or of the exam type.”

JAN LEEUWS

Better viewing of difficult areas

- High level of detail in the mediastinum
- Sharp trabecular, carpal and cortical bone
- Balanced presentation of both soft tissue and overlapping bone structures
- Clear visualization of subtle details in the abdomen
- True representation of implants with clear bone interfaces
- No need for window level adjustment, resulting in very comfortable & fast reading

The diagnosis is in the details

With its larger dynamic range, the new version of MUSICA offers enhanced detail of images and consistency of visualization, especially for images with large differences in signal strength. Image processing is robust and the image is always optimal, independent of the exposure technique. “Subtle bone details often tend to fade in the vicinity of implant edges, but with the next generation MUSICA, these details are well preserved and easily visible. I compare it to being able to hear a pianissimo passage after an explosion,” says Piet Vuylsteke.

For example, in skeletal imaging, no artificial shadows show up next to long bones or metal implants, making subtle details of the interfaces more visible. Trabecular structure is presented with improved sharpness, and there is appropriate transparency in overlapping structures such as the carpal bones. In chest X-rays, details from the bones, the mediastinum and the lower part of the lung behind the diaphragm are revealed with better clarity, without impairing the lung visualization.

Jan Leeuws comments: “With MUSICA, we get more details out of an image, and in a more comfortable way. This supports the radiologist to make a confident diagnosis in a shorter time frame, improving the overall workflow of the department.”

Adapted to users’ real needs

To make sure that the image processing was optimally adapted to the needs of the users, the development team collaborated with regional and leading university hospitals worldwide, including different specialties such as pediatrics, chest, etc.

When developing the new software version, it was critical to be 100% sure that the intelligence built into the system renders images with optimal diagnostic information. “When we showed the radiologists the new version of MUSICA, they often got used to the new image presentation very quickly!” says Piet Vuylsteke. “Once you appreciate that level of detail, they said, ‘there’s no going back’.”

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