ENGLISH TRANSCRIPT 'VOICE OF REMBRANDT' DOCUMENTARY

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Noise from museum visitors fades out.

Jonathan Bikker: Rembrandt was someone who believed in himself. Yes, he did not doubt. Which…

Sound from the museum's loudspeakers: Ladies and gentlemen, we would like to point out that the museum will close in 15 minutes. We request that you go to the exit.

Fatos Vladi: When the last visitor to the Rijksmuseum has left ...

(Jonathan Bikker: now in English ...)

Fatos Vladi: … together with Rembrandt's biographer Jonathan Bikker, I look at almost all of Rembrandt's self-portraits. We are surrounded from all sides by Rembrandt. He looks us straight in the eye, but says nothing.

Jonathan Bikker: From all those self-portraits, you also form in your head a bit of an idea of what that man sounded like.

Music

Fatos Vladi: How did Rembrandt sound?

Since a short time, we dare to ask this crazy question. A scientific team from America and the Netherlands reconstructed earlier this year the voice of Rembrandt based on his self-portraits.

Prof. Rita Singh: So, we had more than eighty self-portraits:

Fatos: Professor Rita Singh from Carnegie Mellon University in America headed the scientific team.

Prof. Rita Singh: And then from these we tried to reconstruct an 3d rendition of his face.

Fatos: Based on his self-portraits, the team made a 3d model of Rembrandt's head. And on the basis of this 3d model, they were able to calculate the size of Rembrandt's vocal space.

Prof. Rita Singh: The nasal chamber, the oral chamber, and behind the two, there is what we call the pharynx.

Fatos Vladi: The larynx, nasal cavity and oral cavity form together the vocal space in which the voice is created.

Prof. Rita Singh: The voice is supposed to carry more accurate information about your age.

Fatos: The team had to decide the age at which Rembrandt speaks to us. That is the age of 55, as shown in his self-portrait as apostle Paul.

And now 350 years after his death, Rembrandt finally speaks to us:

Reconstructed voice over Rembrandt: Light and dark, that's what will make your painting come alive. I want to teach you a good thing about this case today.

Fatos: Is this really Rembrandt's voice?

Music

Fatos: I'm going to investigate in two ways how reliable is voice technology: first, by having my own voice tested in Professor Singh's office; secondly, by having Rembrandt's voice independently tested again by the same technology.

I present the results of the second test to Rembrandt's biographer Jonathan Bikker. He knows Rembrandt like no other.

Jonathan Bikker: Yes, because I know him so well, I also tend to think: yes, he is one of us.

Fatos: Yes?

Jonathan Bikker: those curls, of course, which make him very familiar, and that potato nose,

Fatos: Yes.

Jonathan Bikker: ... but sometimes the nose has been a bit more refined.

Fatos: I'm going to have my own voice tested first:

Prof. Rita Singh: Okay, can you hear me now?

Fatos: Yes, I do.

There is a supercomputer in In Prof. Singh's office in which the latest insights on voice technology and artificial intelligence have been collected.

Prof. Rita Singh: You say something in Dutch.

Fatos: This supercomputer can provide a lot of information about your physical characteristics and personality, based on your voice. How reliable is this supercomputer?

Prof. Rita Singh: If you can see the screen, you are supposed to read the passage on the screen.

Fatos: To be clear: the supercomputer knows nothing at all about me and nothing at all about Rembrandt.

Prof. Rita Singh: We want to turn the microphone on and then this thing will analyze your voice, in a very short time. It will give you all kinds of information about you.

Fatos: I'm talking to Professor Singh on Skype. She is standing next to the supercomputer.

Prof. Rita Singh: Right?

Fatos: The voice fragments go directly to the brain of the computer via a sensitive microphone.

Prof. Rita Singh: Keep looking at the screen, it says: Speak!

Fatos: The supercomputer is about to analyze my voice. For this purpose, I am now going to speak/record an excerpt from Rembrandt's biography on the microphone of the computer.

Prof. Rita Singh: Yes.

Fatos: Here is the excerpt:

Rembrandt was a very short-tempered man and he hated everyone. Rembrandt was a keen observer of the world around him and eagerly captured both the beautiful and the ugly, as much the extraordinary as the ordinary.

Prof. Rita Singh: Can you see the screen?

Fatos: Yepp.

Prof. Rita Singh: It says: Analyzing ... Right?

Music:

Prof. Rita Singh: So, we can get the height, weight, age, ethnicity ...

Fatos: The computer estimates me 10 centimeters taller than I really am.

One eighty.

And estimates that I am more than ten years younger.

Prof. Rita Singh: I thought you were in your thirties…

Fatos: No, no, no, I am fortyeight.

My age is therefore not correct. But most people think I am a lot younger. Just like the supercomputer.

Prof. Rita Singh: Please keep your fingers crossed.

Fatos: I have no illnesses. That's right.

Yes, I have had a lot of stress in the last days. Yes.

I have high mental stress. That's true. I have been experiencing a lot of stress this week.

But my blood pressure is perfect and that's right.

Prof. Rita Singh: Personality features, behavior.

Fatos: My personality:

Prof. Rita Singh: Okay.

Fatos: I am a mild person to a great extent. That's right.

Prof. Rita Singh: Yes.

Fatos: More than a third of my personality is neurotic. That is also correct.

Prof. Rita Singh: Whether you are intoxicated or not.

Fatos: The computer correctly finds that I have not used drugs or alcohol.

No intoxication! OK!

Prof. Rita Singh: Scientifically I know that this is the best guess we can take.

Fatos: I find that the supercomputer can accurately estimate my physical condition and my personality for more than 80 percent!

Prof. Rita Singh: All right!

Fatos: But I am especially curious to what extent the supercomputer can extract Rembrandt's physical properties and personality from his voice.

Voice of Rembrandt: *Light and dark depend on each other.*

Fatos: Jonathan Bikker.

Jonathan Bikker: I don't know of any other self-portraits where the light comes from behind, before Rembrandt applied it. By letting the light come from behind instead of from the front, he comes across as a mysterious person and a genius.

Voice of Rembrandt: *Light and dark light make each other visible.*

Prof. Rita Singh: It could have been Rembrandt's voice.

Fatos: Rita Singh.

Prof. Rita Singh: I am happy with the result.

I am not very happy with the machine-like quality of the voice.

Music

Fatos: I'm now going to have Rembrandt's voice analyzed by the supercomputer.

Are we going to get confirming information about Rembrandt from his voice, or are we going to get a completely different person?

Prof. Rita Singh: Yes.

Short music fragment

Voice of Rembrandt: Light and dark: that's what would make your painting come alive. Today, I want to teach you a good thing about this case. The light does not fall in the same measure on everything.

Music

Prof. Rita Singh: It says: analyzing ...

Still analyzing ...

Prof. Rita Singh: Okay. It got the skull structure and perikly. Caucasoid.

Fatos: According to the supercomputer, Rembrandt is Caucasian, thus white, European. He has a very high mental exhaustion.

Prof. Rita Singh: Okay.

Fatos: He is mentally exhausted, but his physical fatigue is moderate. It is true, he didn't do heavy physical work.

Prof. Rita Singh: Yes.

Fatos: He has a normal heart rhythm and normal blood pressure. He was healthy.

Heart rate is normal.

Prof. Rita Singh: And then

Fatos: *Blood pressure is good.*

According to the supercomputer, he is 57 years old,

Prof. Rita Singh: Okay.

Fatos: … two years older than in his self-portrait as Apostle Paul, in which he was 55 years old.

Prof. Rita Singh: Yes.

Fatos: In fact, he looks older then 55 in his self-portrait.

Jonathan Bikker: Yes, and you can see from his face how it has changed ...

Fatos: That is what Rembrandt's biographer recognizes

Jonathan Bikker: Yes, he looks very fragile.

Fatos: His Personality.

Prof. Rita Singh: Okay.

Fatos: He has a low social score, 15 percent.

Jonathan Bikker: Many of Rembrandt's early biographers say he was gruff, that he was a difficult man.

Fatos: He is a real leader.

Prof. Rita Singh: All right

Fatos: Three quarters of his personality radiates that.

Jonathan Bikker: In some self-portraits he presents himself as a prince. There is one in the Frick collection in New York, from 1658, the year that all the auctions of his home and property took place.

Fatos: Yes.

Jonathan Bikker: Yes, at that low point he paints a huge self-portrait like a king. He sits on a throne like that, like a king. Yes, to that image belongs a deep voice, an authoritarian voice.

Fatos: Yes.

Voice of Rembrandt: *Light and dark depend on each other. They make each other visible.*

Short music fragment

Fatos: One aspect of his personality is very extreme.

Oh, I see, wow!!

Prof. Rita Singh: A very high rating for neuroticism.

Fatos: He's 99 percent neurotic.

Prof. Rita Singh: Yeah, very neurotic. Haha.

I have not seen that before, and I am very happy with that because part of a neurotic personality is this excessive attention to detail.

Fatos: So, he was obsessed with details.

Prof. Rita Singh: And an artist has to be very attentive to detail.

Fatos: The supercomputer largely confirms Rembrandt's physical condition as well as his personality traits. We know from Rembrandt's biographies and also from his self-portraits that he was healthy. He was also rich and took good care of himself. As the supercomputer observes, Rembrandt had a high mental stress. This was first due to the loss of loved ones and later due to financial problems. But, was Rembrandt so extremely neurotic?

I'm calling Jonathan Bikker.

Jonathan Bikker: He was neurotic?

Fatos: Yes.

Jonathan Bikker: Crazy?

Fatos: Yes. Yes.

Jonathan Bikker: Hahahaha!

Yes, really?

Fatos: Yes, 99 percent of his personality was neurotic. Yes, what do you think about that?

Jonathan Bikker: He certainly was obsessive. He was always working.

Fatos: Yes.

Jonathan Bikker: And if you read the early biographies, they say he was an obnoxious man

Fatos: Yes

Jonathan Bikker: … and one of his biographers even says that he hated everyone

Fatos: Yes!

Jonathan Bikker: But then he explains it in such a way, for example: if the king would decide to pay a visit to Rembrandt, and the king knocked on Rembrandt's door, and Rembrandt was at work at that moment, he wouldn't open the door to the king.

Fatos: Yeah!

Jonathan Bikker: The king should return at a moment when Rembrandt was not working!

Fatos: Yes, yes.

Jonatha Bikker: Rembrandt was so intensively involved with his art. Yes, he had no patience for other people who weren't artists, or, or didn't share his passion.

Voice of Rembrandt: You wish to hear from me how you could handle my painting style. Ha! I say to you beforehand: No one, except myself, can paint like Rembrandt. But without trying it, you cannot know it for sure. Attend my lessons and I will teach you the secrets of painting.

The End.

SYONOPSIS OF RADIO DOCUMENTARY 'VOICE OF REMBRANDT' – THE NETHERLANDS

'Rembrandt knew he was a really good painter. He had no doubts whatsoever about himself being a genius person'. (Rembrandt' biographer Jonathan Bikker). This is how the documentary begins.

The year 2019 has been declared **Rembrandt Year** by the government of the Netherlands. This was done to honor Rembrandt, 350 years after his death.
The best place to talk about Rembrandt is Rijksmuseum in Amsterdam.
Last year, for the first time, more than 95 percent of Rembrandt's works were exhibited at Rijksmuseum. The biggest collection of his self-portraits ever was separately exhibited at the museum as *All Rembrandts.*
In the same year, a multidisciplinary, scientific team from America and the Netherlands reconstructed Rembrandt's voice, based on his 88 self-portraits, using artificial intelligence (AI) techniques. For the first time, since his death we heard Rembrandt talking to us in a couple of video tutorials, teaching his students how to paint. His voice is a bit robot – like, and yet, it does not sound like any other familiar voice.
Is this really the voice of Rembrandt?
Fatos Vladi is fascinated by both the vision and the voice and decided to investigate the authenticity of the reconstructed voice.
Vladi started his investigation at Rijksmuseum, taking to Rembrandt's biographer Jonathan Bikker, while watching Rembrandt's almost obtrusive self-portraits.
Bikker is convinced that Rembrandt self-portraits can tell us a lot about Rembrandt's voice sounded. Consequently, the narrator describes in less than one minute, together with professor Rita Singh, the process of the voice reconstruction.
We hear shortly the voice of Rembrandt: 'Light and dark: this is what is going to make your painting come alive'. This quote from Rembrandt comes back in slightly different forms in the documentary and it serves as a refrain. Rembrandt is known a master of contrasts.
From this perspective, Vladi shifts to the second storyline, that is the interview with the professor Rita Singh from Carnegie Mellon University in the US. Professor Singh has been leading the scientific team which reconstructed the voice of Rembrandt. The first question which Vladi raises is:
How reliable is the AI?
In order to answer this question, Vladi decides to test his own voice with the best AI techniques which were used to reconstruct the voice of Rembrandt. These techniques have been clustered in a supercomputer at Carnegie Mellon University where prof. Singh works. At the moment on which Vladi tests his voice, using this supercomputer, the supercomputer knows nothing about him and also nothing about Rembrandt.
During the test, Vladi discovers to his great surprise that the supercomputer can estimate a big part of his physical and personality features, solely based on the voice. There are some features of Vladi which the supercomputer inaccurately estimates (e.g. age), but these are the same features which are also misestimated by most people who meet Vladi for the first time. Vladi is 48 years old, but most people think he is in his thirties.
Looking further at the results of the test, Vladi discovers to his great surprise that the supercomputer knows exactly his blood pressure, level of blood intoxication and many of his

personality's features. Some 80 per cent of the information from the supercomputer is accurate!
The next step in Vladi's examination of voice is testing the (reconstructed) voice of Rembrandt. During this test, we hear that the supercomputer is succeeding in identifying most of Rembrandt's physical conditions and personality features. Features, such as the level of his mental exhaustion, his good physical health, together with personality features such his anti-social attitude and leadership qualities, are simultaneously confirmed by Rembrandt's biographer Jonathan Bikker.
Suddenly, as Vladi and prof. Singh are testing Rembrandt's voice, they notice something remarkable on the information provided by the supercomputer! Rembrandt's neuroticism is extremely high. According to the AI analysis of his reconstructed voice, Rembrandt's personality was for 99 per cent neurotic!
Prof. Singh is really surprised by these results which were unexpected to her.
Vladi goes back the Rembrandt's biographer Jonathan Bikker to tell him the results of the test. Bikker is initially speechless, hearing about Rembrandt's high level of neuroticism, but he quickly confirms the results of the test by the supercomputer. Bikker quotes early biographers of Rembrandt who describe him to be extremely obsessive with his work. Extreme obsession and neuroticism are closely related to each-other.
'If the king would decide to pay Rembrandt a visit at his atelier, Rembrandt would not open the door to receive the king, but ask the king to come later at a more convenient moment for Rembrandt.'
At the very end, we hear Rembrandt saying that 'no one can paint as he did.'