

# GU Art Gallery Installation Turns Visitor Heartbeats Into Interactive Art

By Priya Klein, Special to The Hoya

An exhibit open at Georgetown University Art Galleries from Sept. 18 to April 11 actively records visitors' heartbeats to highlight the individuality and beauty of the human body.

Using cameras and sensors, Rafael Lonzano-Hemmer's "Look Alive" display maps the heart rates of visitors onto the gallery's 3,000 light bulbs. The exhibition, which will run from Sept. 18 to April 11, uses complex technology to create an interactive experience that highlights the beauty and individuality of the human heartbeat.

Jaynelle Hazard, head of GU Art Galleries, said the technology in "Look Alive" is not just for novelty; it symbolizes the importance of technology in modern society.

"He's not using technology just because it's something new. He actually speaks about using technology because it's the language of our time," Hazard told The Hoya.

The exhibition centers around pulse topology, which uses remote photoplethysmography (rPPG) to measure changes in blood volume in the skin by emitting light onto the skin and measuring how much is reflected. Instead of requiring physical contact, "Look Alive" uses rPPG to measure a visitor's pulse remotely using a camera to measure subtle changes associated with blood flow to calculate heart rate, which is then translated into light and sound throughout polycarbonate lightbulbs in the gallery.

Stephan Schulz, the head of Lozano-Hemmer's research and development team, said the camera is able to recognize human hands by establishing what the background looks like and then detecting changes when a visitor places their hand underneath it.

"That simple difference can be used to say, 'Okay, now something is there.' It could be just your arm, your hand, your face, whatever," Schulz told The Hoya.

Visitors place a hand beneath a sensor, and a camera measures subtle changes associated with blood flow to calculate their heart rate. As the heart beats, blood volume in the microvasculature — the body's smallest network of blood vessels — increases, causing more light to be absorbed and less to be reflected. Between heartbeats, blood volume drops, leading to more reflection.

Schulz said that Lozano-Hemmer's artwork relies on visitor engagement and participation.

"Artwork of his is not really fully complete or activated until a visitor participates with it," Schulz said. "Because our heartbeat, this involuntary spasm, we can't control it."

Schulz said he remembers a time when someone with a pacemaker visited the exhibition, creating a uniquely slow but steady heartbeat.



Matthew Gassoso/The Hoya

A new exhibition at GU Art Galleries is connecting art with the workings of the human body by recording visitors' heartbeats.

“And so the uncontrollable factor is the visitor in this case, more so than the technology,” Schulz said.

Schulz said the technology can also provide unexpected insights into the human body, recalling how one of Lozano-Hemmer’s previous artworks detected his own father’s atrial fibrillation (AFib), a common type of heart arrhythmia.

“I told him, ‘Well, it’s art. It doesn’t diagnose you. It just makes you notice things,’” Schulz said. “But he went to the doctor afterwards anyway, and the doctor noticed that he had AFib.”

While “Look Alive” isn’t a medical device or diagnostic tool, Schulz said he hopes to improve the system’s accuracy and add features such as electrocardiograms (EKGs) in the future.

“I always still am trying to improve those algorithms to become more medically accurate, so that maybe one day — because right now we’re just detecting the BPM, we’re not looking for any of the EKG curves that you usually see in these things — I’m hoping now with AI, as we all use it now, I will be able to filter out even more information,” Schulz said.

Hazard said the cameras detect visitors’ heartbeats and location, but do not collect personally identifiable information, with the heartbeats only remaining recorded until another visitor replaces it.

“Nothing is permanently stored or shared. And that was a key point for us as the galleries is that we certainly want visitor privacy. We know about sensitivities that are happening in terms of data collection now,” said Hazard.

Al Acres, the chair of the art history department, said the exhibition’s significance lies in the experience it creates for visitors.

“There is other interactive contemporary art these days. What I like about the Lozano-Hemmer pieces is how genuinely meaningful they are,” Acres told The Hoya. “The technology used is intensely personal because you see your own heartbeat, yet it is also collective, as you see the heartbeats of thousands of others within the same space.”

Acres said that over the last few decades, people have increasingly realized that university art museums and galleries are not solely for aesthetics and can be relevant for multiple areas of study.

“They really are part of research and curriculum, and engaging with other fields,” Acres said. “Rafael Lozano-Hemmer’s work obviously connects with science, but it also connects in interesting ways with politics, economics, history and society itself.”