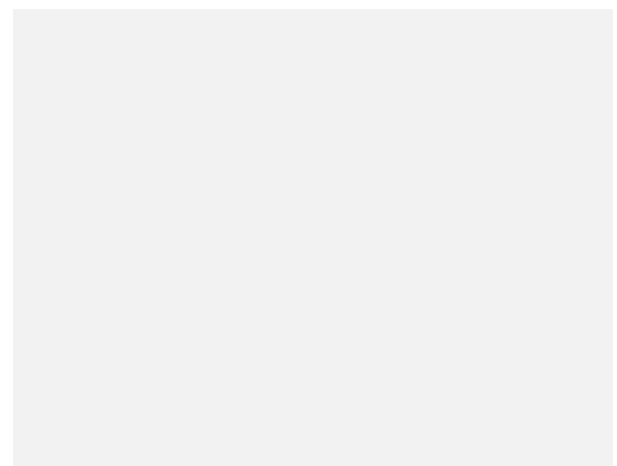# Dutch IT award recognises importance of research in the wild

Promoter of human-centric scientific research techniques claims the prestigious 2020 Netherlands Prize for ICT Research

By
Kim Loohuis Published: **13 Nov 2020 14:31**

Centrum Wiskunde & Informatica (CWI) scientist Pablo Cesar, a proponent of scientific research in the real world, tells Computer Weekly about his people-centric work.

Although research outside the laboratory is much more difficult to control, the results are more valuable, he says. The jury of the 2020 Netherlands Prize for ICT Research agreed, praising him for his research in real-life situations, and confirmed the value of this approach to science.

Cesar was born in Madrid, Spain, and chose to take his PhD at Aalto University in Helsinki, Finland. Although the support for science in Finland is excellent, he decided to move to the Netherlands to further his career.

When the opportunity arose, 15 years ago, in Amsterdam to take a research position at CWI, Cesar did not have to think long. "The Netherlands has a very strong knowledge and research environment, which appealed to me enormously," says Cesar.

Social television

In 2005, the researcher started at CWI, where he joined a team that researched and experimented with social experiences around the consumption of television. According to Cesar, the research focused on the fundamental problems and opportunities related to the interaction between people and technology.

"We investigated how we could allow people to watch television together while being separated from each other," he says.

This was later extended to remote family games and other activities people can do in a living room. "The goal was to connect people when apart," says Cesar.

Cesar was already working on embedded systems like television set-top boxes in Helsinki, "but for my PhD the focus was more on the hardware and software problems, and not on the human factors and social aspects," he tells Computer Weekly. Around 2010, Cesar also picked up research into 3D video conferencing or holo-portation.

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Realistic context

In addition to lab environments, Cesar and his team conduct research in realistic settings.

"I tend to focus outside the lab in my research. The type of data and results you get are different. Obviously, in a lab, you get fairly clean results, because the setting allows you to control the variables and the way you change them," he says.

"When you perform research in the wild, you need to build different types of systems, because there is more noise. But bringing it outside allows the team to understand how our research actually impacts society."

Human-machine interaction

The human being is therefore central to the research of Cesar and his Distributed and Interactive Systems (DIS) research group. His ultimate goal is quite simple.

"The interfaces should be invisible, allowing for natural and seamless communication," he says. "Right now, we are all working from home and having video conferences, interacting with a camera and a screen. My goal is to make this interaction much more natural, and hope that in the future we will get into a situation where we can use our human natural communication skills for communicating with machines."

His research focuses on answering the questions of how we communicate with the devices around us and how we can improve that communication and interaction.

Prize for ICT research

Every year, the Royal Dutch Science Society (KHMW) awards the Netherlands ICT Research Prize to a scientific researcher who has carried out innovative research or is responsible for a scientific breakthrough in ICT. This year, the prize was awarded to Cesar, the group leader of DIS at CWI and a professor at the Delft University of Technology.

Due to the Covid-19 coronavirus outbreak, the prize could not be awarded to the scientist until after the summer. The prize is linked to a sum of €50,000, which may be used freely by the winner to strengthen their research.

Human-centric research

"I am incredibly honoured with the prize, as it is a recognition for human-centric research in the Netherlands," he tells Computer Weekly.

> "We, computer scientists, build algorithms, and they need to be human-centric. If we don't take into account human factors, we may design the wrong type of algorithms"
> **Pablo Cesar, CWI**

"This type of research in computer science is much more established in the US, but in Europe it has only been on the rise for the past 20 years. We, computer scientists, build algorithms, and they need to be human-centric. If we don't take into account human factors, we may design the wrong type of algorithms. This prize is a recognition of such a scientific approach and is very helpful for the community.

"As a researcher, writing all these papers and trying to get them published, I am quite used to rejection. So winning feels absolutely great," he adds.

Symposium

Cesar already has plans for the prize money. "I would like to organise a symposium with top researchers from the field to discuss and exchange ideas about the current state and future of our research. That's very valuable for my team, because in this way we also get to know other views and perspectives."

But the symposium will have to wait, because Cesar would like to combine it with his inaugural lecture as professor at TU Delft next year. "Moreover, Covid must be over before I physically bring everyone together," he says.

3D video conferencing

The crisis has, however, spurred extra attention to his research into 3D video conferencing (or teleportation). "Now that everyone works from home as much as possible and meetings are often virtual, we are noticing the shortcomings of current video conferencing technology and the impact that screens have on us," says Cesar.

In 3D environments, people are often shown as avatars, and whether that avatar is correct depends very much on the context of the communication. "When playing games, an avatar may be adequate, but when you want a doctor to take a virtual look at your knee problems, you need a real-time representation of yourself."

Optimising network usage

Cesar's team is currently focusing on the development of a universal system that is so accessible

that it can also be used in a standard living room.

Optimising network use is key in this respect. For example, the researchers are looking at mechanisms whereby only parts of the image are sent or high resolution is only used for parts where attention is focused, such as when a doctor assesses a knee.

"It is also not necessary to send images of someone's back when you are in a meeting," says Cesar. "The system must be able to assess very well what is important and what's not, based on the context of the interaction."

Collaboration

"The technology is ready for this, but we are researchers and don't develop real products. What I have seen with social television is that it took almost 15 years for it to attain real-life adoption," adds Cesar. "Adoption takes time. Eventually, there will be companies that will take our findings and develop products that work."

> "The technology is ready for this, but we are researchers and don't develop real products. Eventually, there will be companies that will take our findings and develop products that work"
> **Pablo Cesar, CWI**

Research institute TNO, for example, is more focused on applying scientific research and has been working for some time on eXtended Reality, a technology that is close to Cesar's research.

Although CWI is a scientific institute and TNO focuses more on application, the organisations work together and share knowledge. "The Netherlands has a strong knowledge culture, interesting and impactful ideas are born here. That means many visionary ideas will be coming from the Netherlands," concludes Cesar.

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