

🏠 > News & events > European Inventor Award > Meet the inventors > Marta Karczewicz

Marta Karczewicz

Advances in video compression



Marta Karczewicz - Advances in video compression (ceremony)



Category
Lifetime Achievement



Technical field
Audio-visual technology



Company
Qualcomm Inc.

Polish software engineer Marta Karczewicz dedicated her career to inventions that enable fast, high quality streaming. Named as inventor in almost 130 granted European patents, Karczewicz's technologies have transformed the video entertainment industry and made video streaming on laptops and mobile devices available to a wider audience.

Finalist for the European Inventor Award 2019

Streaming is testing the limits of modern infrastructure for telecommunications. High definition videos require bandwidths of over 30 gigabits per second to play in real time. This is much higher than the provision of standard internet connections. In principle, most homes and mobile phones only receive raw data fast enough to display thumbnail-sized videos in low resolution. But in practice, most smart devices - computers, televisions, tablets, phones and so on - can recreate a rich visual experience with even a modest internet connection. Their secret lies in an arsenal of data compression tricks pioneered by Dr Marta Karczewicz.

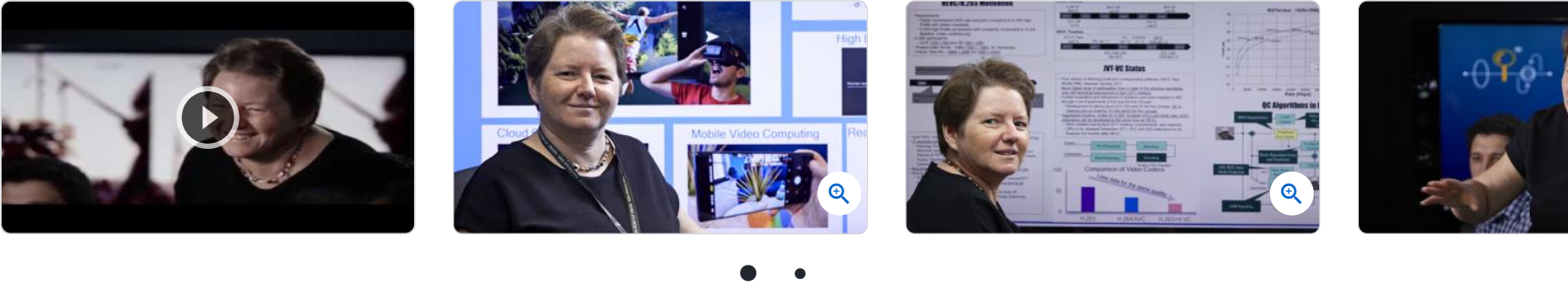
Karczewicz developed key components of Advanced Video Coding (AVC), the most commonly used video codec on the market for the recording, compression and distribution of video content worldwide. The codec is the technology which compresses the video, based on the principle of reducing redundancy or repeated information by exploiting the similarities within a frame or between successive frames in a video. Her patented deblocking filter, typically used in set-top boxes, smoothens pixels arising along sharp outlines and 'ghost-like' halos in images. AVC simplifies images for transmission by breaking them down into simpler blocks of information. It reduces the file size and produces sharper contrasts between adjacent blocks. The deblocking filter examines pixels within neighboring blocks and smoothens out sharp variations, maintaining image quality while reducing file size.

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In just two decades, Karczewicz's inventions have helped compress video files by a factor of 1 000. As a result, existing infrastructure is now capable of streaming video at a quality far superior to that offered by DVDs. This has given rise to streaming services like Netflix and given audiences the potential to enjoy films everywhere using mobile devices. Many of her patents cover technology that is making it possible for families, friends and colleagues to communicate in real-time via video conferencing. Her advances have also allowed audiences to use virtual and augmented reality applications on their mobile devices.

Born and raised in Poland, Karczewicz was passionate about mathematics. She ranked among the top 10 at the Mathematical Olympiad in Poland and later secured a grant from Nokia to study information technology at Tampere University, in Finland. In 2006, Karczewicz became Vice President of Technology at Qualcomm Technologies Inc., a telecommunications multinational with headquarters in San Diego, USA. She has since filed hundreds of patents and led sector-wide research into better standards for data compression.

Media gallery

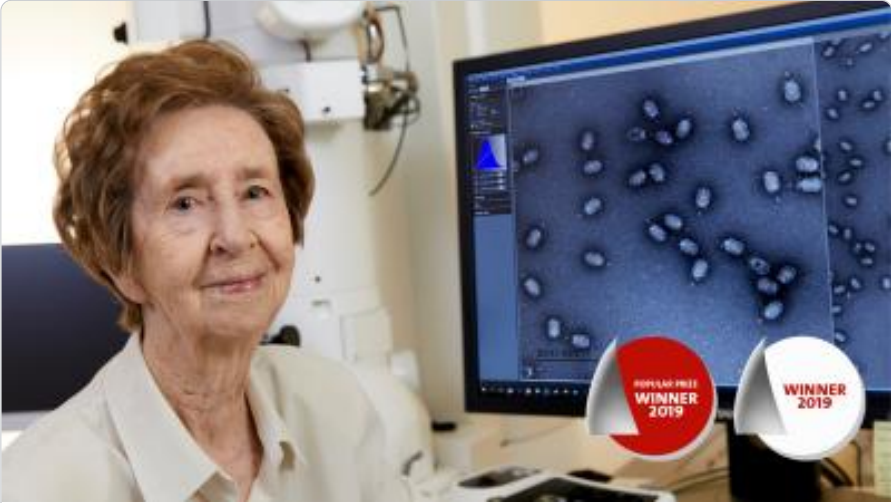


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