ACM SIGMM Award for Outstanding Technical Contributions to Multimedia Computing, Communications and Applications

The 2017 winner of the prestigious ACM Special Interest Group on Multimedia (SIGMM) award for Outstanding Technical Contributions to Multimedia Computing, Communications and Applications is Prof. Dr. Arnold Smeulders. The award is given in recognition of his outstanding and pioneering contributions to defining and bridging the semantic gap in content-based image retrieval.

During the early years of his scientific career Dr. Smeulders studied the invariant fundamentals of lines, shapes, textures and colors. This resulted in several PAMI papers (IEEE Transactions on Pattern Analysis and Machine Intelligence) that are still being cited today. Besides the written record, Arnold always had the drive to showcase academic results in real-world systems. In 1989 he introduced the Diagnostic Encyclopedia Workstation: a system containing 3,000 images from pathology combined with what we would now call a handcrafted ontology. Already then he showed his great ability to generalize results as in 1991 he launched one of the world’s first image search engines that combined automatic indexing, interactive retrieval, and evaluation. During this period he was also instrumental in building our community, organizing the first conferences, and defining the semantic gap as the fundamental problem in image retrieval. The end of this era culminated in what became the most cited paper of our discipline: Content-based image retrieval at the end of the early years.

The culmination of Dr. Smeulders’ pioneering research in content-based image retrieval in his seminal paper has been the starting point for new research in algorithms and systems for bridging the semantic gap in his group. It led to scientific contributions in early versus late fusion, semantic path finding, similarity based visualization, learned lexicon driven video retrieval, the MediaMill 101 challenge, and neighbor voting for tag ranking. To date, Arnold has graduated 45 PhD students on the broad topic of content-based image retrieval. His approach to student supervision is simple; Dr. Smeulders just asks the right questions. If students are not yet ready to realize the deep insight behind the question, he will patiently lead them to the answer, always giving the students the feeling they came up with the answer themselves. Arnold enjoys putting his students on the stage, while he is watching from behind in the wings. His mentoring approach has proven effective as his students have won all the image and video retrieval benchmarks that matter, including PASCAL VOC, ImageNet, ImageCLEF and several editions of the NIST TRECVID concept detection and interactive video retrieval challenges. Moreover, multiple best paper and demo awards have been handed out to his students at ACM CIVR (2009, 2010), ACM MM (2005), IEEE TMM (2012), notably in 2014 both the multimedia grand challenge and the best paper in MM, and in 2013 Xirong Li received the SIGMM Best Ph.D. Thesis Award for work on content-based visual search learned from social media. Another proof of Dr. Smeulders’ ability to nurture research talent is that about twenty former students are still active in science, already five of them have made it to the rank of full professor.

Apart from his talent for science, Arnold has another super skill. He is one of the few people able to conceive large-scale research initiatives, mobilize researchers and industry practitioners from various backgrounds, letting them collaborate, and making them flourish. First he did it in the Amsterdam region with the Multimedia Information Analysis program. Then he made the jump to the entire country with MultimediaN. His latest project extends the scope from multimedia to ICT in general, with the nationwide COMMIT program. With each of these steps the scale has increased by almost an order of magnitude in terms of budget and number of researchers involved, with COMMIT being a project with
a budget of well over 100 Million Euros. In doing so, he has facilitated and sustained the academic career of many multimedia researchers in the Netherlands. Dr. Smeulders’ has been instrumental in creating, sustaining and nurturing the research climate for multimedia in the Netherlands.

At the end of the early years of his career, Dr. Smeulders has been more active than ever before. He continues to lead a group of 20 people. He launched a start-up company on content-based image retrieval, made it profitable and sold it to Qualcomm. Together with Qualcomm and the University of Amsterdam he established a new joint research lab with a focus on understanding pictorial content by mobile deep learning. Arnold drives the ICT policy agenda for the Netherlands, convincing the powers that be there is no innovation with ICT when not preceded by innovation of ICT. And last but not least, he managed to attract the two communities that contributed most to content-based image retrieval to Amsterdam for two flagship conferences during one memorable week in October 2016.

It is for these reasons that we award the ACM Special Interest Group on Multimedia (SIGMM) award for Outstanding Technical Contributions to Prof. Dr. Arnold Smeulders

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ACM is the professional society of computer scientists, and SIGMM is the special interest group on multimedia.

Photo by the photographer Mr. Peter Boer