LAUDATIO HONORIS CAUSA NURIA OLIVER

Elche, October 4, 2018

*Your excellent and magnificent Rector, excellent Vice Rectors, illustrious Registrar, excellent and magnificent Honorary Rector, excellent and illustrious authorities, colleagues and university community members, ladies and gentlemen.*

It is a personal honor to occupy this space at our university to deliver the *Laudatio* for computer researcher and Alicantina, Ms. Nuria Oliver Ramírez.

I began following Nuria Oliver academically back in 2005, when I began to redirect my research lines toward investigation in human-computer interaction, which is one of Nuria’s areas of expertise, about which I will present and attempt to summarize in this brief presentation about her merits. Such merits are what led me to propose nominating her as Doctor Honoris Cause through my research institute, the Center of Operations Research (CIO), which was then approved by the Executive Board of this university on July 3, 2017.

However, when we say, allow me to use the expression, “I became a fan” of Nuria while streaming a conference from my UMH office, which I found quite by accident that same morning, that she presented on April 28, 2016 at the event organized by Microsoft Madrid entitled “Make What’s Next.” This event coincides with the “International Day of Girls in ICT,” which the International Telecommunications Union (ITU) has organized worldwide every fourth Thursday in April since 2011. On this day, the ITU strives to encourage technical vocations in girls and young women and reduce the digital gender gap. Microsoft also seeks to inspire young and adolescent girls who are interested in pursuing scientific and technical education, as well as supporting, through mentoring and coaching activities, female university students who have chosen STEM educations (science, technology, engineering, and mathematics).

On that day, Nuria presented a conference called “Figuring out the Future” before 200 girls and young people wherein she first talked about her academic and investigative “history” before proceeding to venture about the future of mobile telephones. This is what I would like the starting point of my speech to be, talking about technology and the future.

In an article published on the World Economic Forum blog on October 26, 2016 called “The World in 2045, According to Pentagon Researchers” scientists from DARPA (Defense Advanced Research Projects Agency of the USA) presented how the world might be in 2045.

Their video, recorded in 2015, summarizes the predictions from three DARPA scientists about what they imagined would become reality in 30 years.

Dr. Justin Sánchez, a neuroscientist, believes that we will be at a point where we will be able to control things by simply using our mind: “Imagine a world where you could just use your thoughts to control your environment. Think about controlling different aspects of your home just using your brain signals, or maybe communicating with your friends and your family just using neural activity from your brain.”

Geologist Stefanie Tompkins believes that we will be able to construct buildings and objects that are incredibly strong, but also very lightweight: “Think of a skyscraper using materials that are strong as steel but light as carbon fiber.”

Pamela Melroy, an aerospace engineering and former astronaut, says that in 2045 we will have a very different relationship with the machines around us: “I think that we will begin to see a time when we’re able to simply just talk or even press a button to interact with a machine to get things done more intelligently, instead of using keyboards or rudimentary voice-recognition systems.”

As for applying artificial intelligence to fly airplanes, Melroy imagines that in future airplane landings, the pilot will simply have to say to the flight attendants to “Prepare for landing.” Then, with those three words, the computer will start the series of complex steps (exiting cruising mode, configuring accelerators, etc.) that are necessary for landing. Perhaps with artificial intelligence, cockpit pilots will not even be necessary.

Predicting the future is full of challenges and obstacles, and this is what Nuria Oliver has done during her entire professional and academic life: accept challenges and work for the future, like I am going to present to you next, outlining her merits in four major areas: academics, research and transfer, research management, and dissemination of technological research.

Beginning with her academic background, Nuria Oliver attended the public Miguel Hernández High School in Alicante, and then continued at the Technical University of Madrid where she graduated with a Superior Degree in Telecommunications Engineering in 1994, tops in her class, and was awarded the First National Prize of Telecommunications Engineers of Spain that very same year.

Ever since high school, Nuria was attracted to research, and during her fourth and fifth years at college she was awarded the International Student Circle Grant from Siemens. This enabled her to work during the summers of 1992 and 1993 at the Siemens R&D research laboratories in Munich on parsers, grammars, and compiler evaluations as part of the EU ESPRIT *Benchmarking for Embedded Control and Real-Time Applications* project.

In 1995, she was awarded a grant from the La Caixa Foundation to pursue graduate education at the Massachusetts Institute of Technology, and there she joined its Media Lab in its Perceptual Computing unit. There, she was involved in perceptual intelligence projects with the objective of building intelligent systems capable of perceiving and recognizing what is going on.

In 2000, she earned her Doctorate with Honors in Media Arts & Sciences at MIT with her thesis, *Towards Perceptual Intelligence: Statistical Modeling of Human Individual and Interactive Behaviors*. Her director there was Professor A. Pentland.

During her time at MIT, I would like to highlight her first project, that of creating the software for a system for recognizing facial expressions in real-time (LAFTER). This was presented at the 1996 SIGGRAPH and 1997 CVPR international congresses. SIGGRAPH is the ACM International Conference on Computer Graphics and Interactive Techniques, which has been held since 1974 by the ACM (Association for Computing Machinery), the most prestigious international association in the computing field. CVPR is the IEEE Computer Society Conference on Computer Vision and Pattern Recognition. She then published that work in 2000 in the journal of *Pattern Recognition* as *LAFTER: A Real-Time Face and Lips Tracker with Facial Expression Recognition*, and it was proclaimed Winner of the Special Mention Award from the Pattern Recognition Society as an Outstanding Publication.

We could say this was, 20 years ago, one of the precursors of today’s systems for recognizing facial expressions (of emotions) and faces in mobile telephones. Nowadays, high-end mobile phones, such as the iPhone X and Samsung 9, incorporate these systems as standard and they enable us to open sessions without entering a PIN, pattern, or fingerprint.

During her time at MIT, she also worked on research projects with intelligent cars, such as a project with Volvo where they built sensors that the car did not possess, including a sensor for detecting the steering wheel’s angle of rotation. She also developed artificial intelligence algorithms for recognizing and predicting the maneuvers the driver was going to perform before they took place in order to achieve safer driving.

We could say this work was, 20 years ago, one of the precursors to today’s self-driving cars that are already circulating on roads.

Lastly, allow me to highlight 1997, the year Nuria took part in the inaugural World Intelligent Fashion Show that the MIT Media Lab organized. In it, she collaborated with designers from different fashion design schools, including the Parsons School of New York and the Domus Academy of Milan. There, MIT provided all the technology necessary for making intelligent clothing. Specifically, Nuria collaborated with a team of Milan designers to create a system that enabled deaf people to communicate—the clothing recognized their signing, and then spoke for them so that others could speak with them without needing to understand sign language.

As for her professional endeavors, in July 2000 she joined the Microsoft Research laboratories in Redmond, Washington, USA. There, she worked alongside Dr. Eric Horvitz (who is currently the Director of Microsoft Research) and Dr. Mary Czerwinski (Director of the Visualization and Interaction for Business and Entertainment (VIBE) Research Group at Microsoft Research) as an investigator of multimodal interfaces, intelligent person-machine interaction systems, monitoring of physiological signals in mobiles (in wearables), and statistical machine learning.

Following 12 years in the United States, she had the opportunity to return to Spain in November 2007 to join Telefónica R&D in Barcelona as Scientific Director in Multimedia. At that time, she was the first and only female scientific director to be hired by Telefónica R&D. There, she founded an internationally recognized investigative group in the areas of mobile and ubiquitous computing, statistical machine learning, recommender systems and personalization, multimedia data analysis, human-computer interaction, and Big Data analytics.

In August 2015, she decided to move to Alicante to be closer to her family, thus returning to her hometown from which she had left 17 years earlier. While in Alicante, she left Telefónica in October 2016 to become the first Chief Data Scientist at DataPop Alliance, New York, an international non-profit organization, which is supported by MIT, Harvard, and the Overseas Development Institute, whose objective is to continue making a positive impact on society with Big Data analytics. Nuria holds a position of technical and strategic leadership to provide technical advice on projects that the organization develops, in developing research projects centered on data, and in developing and giving talks on projects to empower women and foster technical vocations in girls.

In January 2017, she joined the Vodafone Group, in London, as the first Director of Research in Data Science, a global leadership position of research and innovation in artificial intelligence and Big Data analytics. Her responsibilities there include defining and carrying out relevant research projects, establishing collaboration with academic institutions, and being invited to speak at international congresses and relevant technological events.

As for research merits, her area of specialization is computational modeling of human behavior from data using artificial intelligence techniques, and the development of intelligent interactive systems.

It must be pointed out that Nuria has published more than 180 scientific papers on computing in high-impact journals and top-level scientific congresses, and overall, her papers have been cited more than 14,800 times. Her most-cited paper is from 2000 and appears in the IEEE journal, *Transactions on Pattern Analysis and Machine Intelligence*, and focuses on modeling human interactions. As of September 17, it had been cited more than 1,800 times, which makes her one of the most-cited female researchers in computing throughout Spain.

She is a co-inventor with more than 40 patents in the areas of human behavior modeling, artificial intelligence, intelligent interfaces, persuasive computing, and data analysis. One of her patents from 2000, that of *Architecture for controlling a computer using hand gestures*, is that cited most according to the Microsoft Academic Research index—as of September 3 of this year, it had been cited 722 times.

Her scientific papers have received the following awards:

* Winner of the Special Mention Award from the Pattern Recognition Society as an Outstanding Publication. 2000
* Best Paper Award. Proceedings of 6th ACM Int. Conf. on Recommender Systems (ACM RecSys'12)
* Technical Impact Award (2014) ACM Int. Conf. on Multimodal Interaction (ICMI)
* Best Paper Award (2014 and 2015). ACM Int. Joint Conf. on Pervasive and Ubiquitous Computing (Ubicomp)

Furthermore, 6 scientific papers of which she is co-author have been awarded best paper at ACM congresses (RecSys’10, CHI’10, Multimedia’09, MobileHCI’09, MobileHCI’06) and one of the IEEE (CVPR’96 - Conference on Computer Vision and Pattern Recognition).

Concerning invited talks, Dr. Oliver has been keynote speaker at 14 international ACM and IEEE international congresses, in addition to more than 100 times an invited speaker for specialized audiences, governmental agencies and international organizations, including the Spanish Senate, ITU, Royal Statistical Society, Menendez Pelayo International University, and GSMA.

She has also given dozens of talks for the general public. Standing out among these are her two TEDx talks and another at WIRED in London, in addition to talks at the Museum of Arts and Science in Valencia, ADDA in Alicante, and her inaugural talk at Art Futura in Alicante.

Dr. Oliver also regularly collaborates with the organization of scientific conferences. She is a program committee member at the main international congresses in her specialty areas and is on editorial committees at international journals. Standing out among these are her participation in organizing committees at 16 international congresses, including the ACM Int. Conf. on Intelligent User Interfaces (IUI) 2009 and 2012; ACM Int. Conf. on WWW 2013; IEEE Mobile Data Management 2016; ACM Digital Health 2016; and the recent ACM MobileHCI 2018 held in Barcelona this past September 3-6.

Lastly, allow me to highlight that she is an ACM Distinguished Scientist from 2015 (and the only investigator nominated in Spain), a Fellow of the European Association of Artificial Intelligence (2016), an IEEE Fellow and ACM Fellow in 2017, in addition to the Spanish Royal Academy of Engineering in July 2018.

During her almost nine years at Telefónica R&D, Nuria Oliver helped position Telefónica (and Spain) among the top international congresses, where historically it had played a limited role. The scientific results of the work completed by her research group were extraordinary, and received 6 prizes for best scientific paper at international congresses, 5 nominations for best scientific paper, in addition to publications at the best ACM, AAAI, and IEEE congresses. She also helped co-create an international internship program, and thanks to it, every year 10-15 doctoral students, as well as numerous undergraduate and master’s students from Spanish universities, were chosen to undergo internships alongside her research group. Three researchers from her team were awarded Marie Curie grants. Her group was one of the few industrial research groups in computing in Spain to obtain these grants in the field of computing.

Throughout her career, Nuria has always expressed an interest in ensuring that her research efforts reach society through innovation and technological transfer. Among others, please allow me to point out the following examples of technological transfer and knowledge:

1. The software for the system for recognizing facial expressions in real-time (LAFTER), which she developed while at MIT, was licensed to Nokia in 1997.
2. Her work on the development of an intelligent car during her years of research at MIT was transferred to Volvo, that project’s main sponsor.
3. The persuasive computing system she developed at Microsoft Research (MPTrain and TripleBeat) that was presented to the Microsoft Zune team has inspired work by companies that market similar ideas such as TempoRun.
4. The MoviPill system, developed jointly with members of her team at Telefónica R&D, was selected by PSFK as a key technology for the future of health in 2010 and presented at the Novartis headquarters in Basilea and the area of eHealth at Telefónica.

Nuria’s work and profile alike have been the recipients of outstanding recognition and numerous awards. She was the first Spanish investigator to receive the MIT TR100 Young Innovator Award; in 2009, she was the first Spaniard to receive the Rising Talent by the Women’s Forum for the Economy and Society (considered the female version of Davos); in 2016, she was the recipient of the Ada Byron Award for the Female Technologist and the European Ada Byron Award for European Digital Woman of the Year, in addition to the Spanish National Award in Computer Science (Angela Ruiz Robles category); and in 2017, she received the medal by the Generalitat Valencia for Business and Social Merit.

In terms of social impact (dissemination of science), Nuria Oliver dedicates a significant amount of her time to scientific dissemination and attracting talent in Spain towards technical and research careers, especially girls. She routinely gives interviews with the media (press, radio, and television) to publicize scientific and technological advances to the public in general. Her projects and profile have appeared in more than 100 pieces in the press, both national, such as *El País*, *El Mundo*, *La Vanguardia*, *Expansión*, *Muy* *Interesante*, as well as international, including *MIT Technology Review*, ABC’s *Good* *Morning America*, *CNN*, *WIRED*, *Le Figaro*, *The Guardian*, *La Reppublica*, and *The Washington Post*. She has been interviewed on more than 25 occasions for radio and television, including RTVE, Cadena SER, RNE, RAC1, ABC Good Morning America, and BluRadio Colombia.

She has been named a senior management pioneer by *El País* (2018), received the *Premio IMPORTANTE* by the *Diario Información* of Alicante (2017), named the fifth-most influential woman in Big Data in the world by *OnAlytica* (2017); and she is one of the 11 pioneers in artificial intelligence worldwide according to *Pioneering Minds* (2017), among others.

Finally yet importantly, I would like to say that Nuria has collaborated with the UMH, speaking on several occasions. These include, among others, our Science Boot Camp in 2017, our Summer School offered since 2016 at our university during the second week of July. Here, she participated from its beginning to attract top high school students and introduce them to the university life of our campus, and promote education in science and technology during one week, where Nuria shared her professional experience with them and inspired them to pursue technological careers. Thank you, Nuria, for helping us promote science and technology to our students, and above all women, which will help to narrow the gender gap, I hope, within a near future.

Finally, to finish this Laudatio, due to all that shown, her fine human qualities, and her contributions to technology and society, I request that we proceed with the investiture of the Excellent Nuria Oliver Ramírez as Doctor *Honoris Causa* by the Miguel Hernández University of Elche.

Thank you very much.

Dr. Federico Botella