



IEEE IROS 2020

Workshop

"Robots Building Robots" ***Digital Manufacturing and Human-centered Automation for Building Consumer Robots***

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Title of your presentation: Introduction to the Workshop

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Abstract

The demand for Industrial Robots (IR) has risen considerably due to the ongoing trend toward automation and continued technical innovations in industrial robots (IR). According to World Robotics 2019, in the year 2018 global robot installations were 422.271 units, worth USD 16.5 billion, and the operational stock of robots was computed at 2.439.543 units. The massive use of robots is key to the development of highly automated and productive factories, that are used worldwide to manufacture virtually all products, mainly mass-market consumer goods but also customized products manufactured under a Lot Size One logics. The forefront technology that IR brought in



Manufacturing is likely ready to leave the industrial environment and enter directly into our homes in the coming years. The robotic market, indeed, is facing the challenge to open towards a new frontier where Robots exclusively utilized in production plants enter unprecedented fields of application. In fact, IR leaders worldwide have already started to be interested in Consumer Robots (CR), robots that can be bought for supporting domestic tasks or for entertainment. Today, autonomously navigating vacuums, pool cleaners, automated kitchen tools, pets, and educational toys are becoming family domestic robots. CR have been fueling visions of having robots living in our homes to assist humans with daily tasks. However, the promise of CR remains largely unfulfilled, despite CR could have an incredibly large market. Indeed, almost 2 billion households in the Western world would be possibly interested in purchasing at least one CR model (within different price ranges). Assuming to fully cover the whole market in 20 years, covering different price ranges (from 1K to 30K euro) of CR, the possible revenues in 20 years could reach almost 2-60 trillion €, having almost 100 million CR sold per year. The workshop will (i) analyse how the current paradigm of industrial automation for manufacturing consumer products could evolve into the emerging paradigm of industrial automation for manufacturing Consumer Robots and (ii) discuss the technical characteristics of new "Robots producing Robots" and of automation cells intended to manufacture CR with high precision, accuracy and at low cost. Four representative classes of CR will be considered as case studies of Digital Manufacturing and Human-centered Automation: vacuum cleaners; drones and aerial robots; educational robots and home robots.