

# **Robotics out of the Mainstream: Special Topics in Agrifood and Laboratory Automation**

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## *Abstract*

Robotics has been the central idea behind flexible automation since its roots. Over the past 60 years, the range of application fields is widening greatly, stepping forward boosted by major technological advancements. Today, the mechatronics under the robots' cover is so developed that it barely limits our imagination when considering a manipulation task or a locomotion-related problem. In the recent era of new-wave robotics, the challenge is to achieve the seamless, high-performance interplay in the jungle of advanced sensors, AI-driven machine cognition, closed-loop control, and the underlying bare metal. There are a wide variety of relatively new areas in which the application of robots gains clear economic motivation. One such area is the agri-food sector, especially the fruit, vegetable, and mushroom harvesting, where human resources render an ever-narrowing bottleneck. At the same time, the crop yield and the overall efficiency pushed higher and higher. Another exciting field is the automation of life science laboratories. COVID-19 has clearly shown that the throughput of pharmaceutical research is crucial when a global epidemic threatens humankind.

My talk will focus on two projects that emerged in the practice of the iROB Center of Óbuda University: The first one is the robotic harvesting of button mushrooms and the related planning problems. The other one is the automatic manipulation of microscope slides. Besides giving insight into these topics, the lecture will also uncover the general background and outlook of some promising research directions that potentially bring a paradigm change in robotic automation.