Séminaire ISIR

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Campus Jussieu, 4 place Jussieu, Paris
Salle de réunion H20

Force and Visual Control for Safe Human-Robot Interaction

Abstract : Applications of intelligent robots that work in contact with humans are increasing, and thus the problem of controlling the physical interaction between the robot and the human in a safe and dependable manner is of concern. This talk is aimed at presenting a unified framework for development of robot interaction control schemes using vision and force; vision provides global information on the surrounding environment to be used for motion planning and obstacle avoidance, while force allows adjusting the robot motion so that the local constraints imposed by the environment are satisfied. The proposed solution is to adopt position-based visual servoing when the robot is far from the object, where the relative pose of the robot with respect to the object is estimated recursively using only vision. The control schemes are experimentally tested on a setup consisting of an industrial robot with open control architecture, force/torque sensor and hybrid camera. Some results with a dual-arm system are also discussed.

Short bio : Bruno Siciliano is Professor of Control and Robotics and Director of the PRISMA Lab in the Department of Electrical Engineering and Information Technology at University of Naples Federico II. His research interests include force and visual control, human-robot interaction, aerial and service robotics. He has co-authored 7 books, 80 journal papers, 200 conference papers and book chapters. He has delivered 110 invited lectures and seminars at institutions worldwide, and he has been the recipient of several awards. He is a Fellow of IEEE, ASME and IFAC. He has served on the editorial boards of several peer-reviewed journals and has been chair of program and organizing committees of several international conferences. He is Co-Editor of the Springer Tracts in Advanced Robotics, and of the Springer Handbook of Robotics, which received the PROSE Award for Excellence in Physical Sciences & Mathematics and was also the winner in the category Engineering & Technology. His group has been granted fourteen European projects in the last seven years including an Advanced Grant from the European Research Council. Professor Siciliano is the Past-President of the IEEE Robotics and Automation Society.

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