



# Instytut Automatyki i Robotyki (IAR)

Wydział Automatyki, Robotyki i Elektrotechniki, Politechnika Poznańska



## Plan seminariów instytutowych (rok akademicki 2023/2024)

prowadzący: dr hab. inż. Maciej Marcin Michałek, prof. PP

|    | Tytuł referatu  | Prelegenci                    | Jednostka            | Data       | Sala | Godz. |
|----|---|-------------------------------|----------------------|------------|------|-------|
| 1  | The problem of the modeling uncertainties in the paradigm of the Active Disturbance Rejection Control*                            | mgr inż. Radosław Patelski    | IAR / Z1             | 11.10.2023 | L123 | 11:45 |
| 2  | Restricted Boltzmann Machine as a binary image descriptors processor and its application in a mobile robot for scene recognition* | mgr inż. Szymon Sobczak       | IAR / Z1             | 18.10.2023 | 16   | 12:15 |
| 3  | Neural multi-sensor navigation system with self-testing*  | mgr inż. Krzysztof Kolanowski | IAR / Z1             | 25.10.2023 | 16   | 11:45 |
| 4  | Nonlinear feedback control of the pendulum-cart system  | mgr inż. Mohammed Saffarini   | IAR / Z1             | 15.11.2023 | L123 | 11:45 |
| 5  | The construction of a soft gripper based on magnetorheological elastomer with permanent magnet                                    | mgr inż. Paweł Czopek         | IAR / Z1             | 10.01.2024 | L123 | 11:45 |
| 6  | Machine learning methods for the control of robotic systems   | mgr inż. Piotr Gapski         | IAR / Z1             | 06.03.2024 | L123 | 11:45 |
| 7  | Visual inspection using artificial intelligence to improve safety of airport area   | mgr inż. Jakub Suder          | IAR / Z2             | 10.04.2024 | L123 | 11:45 |
| 8  | Optimization-based Iterative Learning Control with Applications in Engineering and Healthcare**                                   | prof. Eric Rogers             | Univ. of Southampton | 24.04.2024 | L123 | 11:45 |
| 9  | Design of VFO control laws with respect to time- and control-input constraints  | mgr inż. Rafał Sobański       | IAR / Z1             | 08.05.2024 | L123 | 11:45 |
| 10 | Integration of vision and sensory data in the monitoring of the measurement vehicle environment                                   | mgr inż. Kacper Podbucki      | IAR / Z2             | 15.05.2024 | L123 | 11:45 |
| 11 | Control algorithm for a team of autonomous mobile robots  | mgr inż. Arpit Joon           | IAR / Z1             | 22.05.2024 | L123 | 11:45 |
| 12 | Correction method for the cogging torque effect of the PMSM servo drive   | mgr inż. Patryk Bartkowiak    | IAR / Z1             | 29.05.2024 | L123 | 11:45 |
| 13 | Multi-agent vision system for supporting the performance of orchard spraying  | mgr inż. Piotr Góral          | IAR / Z2             | 12.06.2024 | L123 | 11:45 |

\* prezentacja generalna przed obroną doktoratu

L123 - sala w budynku Centrum Wykładowego i Biblioteki PP  
eM = eMeeting (seminarium zdalne poprzez system eMeeting)

**\*\*Abstract:** Many physical systems complete the same finite-duration task over and over again. One example in robotic applications is the 'pick and place' task, where the mission is to move a sequence of payloads from a fixed location and place them in synchronization on a moving conveyor. The series of operations is as follows: i) collect the payload from the specified location, ii) transfer it over a finite duration, iii) place it on the moving conveyor, iv) return to the starting location, and repeat this sequence for as many payloads as required or until a stop is required for maintenance or other reasons. Iterative learning control emerged in the mid-1980s for application to examples such as the one just described, and since then has been a very active research and applications area. This seminar will first describe the development of an optimization-based design in a Hilbert space setting and then demonstrate its application, with supporting experimental results, to pick and place robots, rack feeders, and robotic-assisted stroke rehabilitation. Some currently open research problems will also be briefly discussed.