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| Session 1: Introduction | * Definition * History * Different types of robots * Importance of robotics * Ethics and concerns |
| Session 2: Components | * Effectors and actuators * Motors (NXT demo) * Gears * Servo motors * Degrees of freedom |
| Session 3: Locomotion | * Stability * Movement and gaits * Steering and Wheels * Joints * Kinematics * Teleoperation |
| Session 4: Sensors | * Types of Sensors (NXT demo) * Mechanics behind sensors * Levels of processing * Break beam Sensors |
| Session 5: feedback control | * Closed loop control * Error handling * Faces of errors * Types of feedback control * Open loop control |
| Session 6: Building blocks of control | * Control architecture * Languages for programming Robots * Control architecture types * Map representation * Cost of representing |
| Session 7: Deliberative and reactive control | * Planning * Costs of planning * Reactive control * Action selection * Subsumption Architecture * How to sequence behaviors through the world |
| Session 8: Hybrid and behavior based control | * Dealing with Changes * Planning * Interaction dynamics * Distributed representation * Behavior arbitration * Behavior fusion |
| Session 9: Emergent behavior and navigation | * Components of emergence * Predictability of surprise * Localization * Searching and path planning * SLAM and coverage * Reinforcement learning * Supervised learning * Learning by imitation * Learning and forgetting |
| Session 10: Group robotics | * Coordination and cooperation * Benefits of teamwork * Challenges of teamwork * Types of groups and teams * Communication * Kin recognition * Distributed control * Architectures for Multi-robot Control |