

Lista zagadnień na egzamin dyplomowy

Kierunek studiów:	Automatyka i Robotyka	Stopień studiów: drugi
Specjalność:	Smart Aerospace and Autonomous Systems (Inteligentne systemy latające i systemy autonomiczne)	

Nr	Zagadnienie
1	Basic tools used in design of nonlinear control algorithms. [Nonlinear systems]
2	Different linearization methods. [Nonlinear systems]
3	Examples of linearization techniques. [Nonlinear systems]
4	Characterization of autonomous systems. Control architecture paradigms in mobile robotics. [Fundamentals of autonomous systems]
5	Basic structures and properties of wheeled robots. [Fundamentals of autonomous systems]
6	Motion control of wheeled mobile robots. [Fundamentals of autonomous systems]
7	Adaptive control with a reference model (MRAC). [Adaptive control]
8	Adaptive control with plant-model identification (MIAC). [Adaptive control]
9	Adaptive control with active disturbance rejection (ADRC). [Adaptive control]
10	Learning algorithms for Artificial Neural Networks. [Basics of smart systems]
11	Radial basis function networks. [Basics of smart systems]
12	Fuzzy inference systems. [Basics of smart systems]
13	Multi-agent systems characteristics; MAS applications. [Design of multi-agent systems]
14	Multi-agent techniques in mobile robotics. [Design of multi-agent systems]
15	Communication in multi-agent systems. [Design of multi-agent systems]
16	Optimal controllers. [Control of under-actuated systems]
17	Linearisation and partial feedback linearisation for acrobat and pole-cart. [Control of under-actuated systems]
18	Energy shaping control for pendulum and cart-pole. [Control of under-actuated systems]
19	Mathematical model of aircraft. [Design of control systems]
20	Linear and nonlinear controllers for aerial vehicle. [Design of control systems]
21	Controller design for mobile robots with respect of dynamics models. [Design of control systems]
22	Vision system in control systems. Types of vision based control. Camera calibration. [Vision based control]
23	Basics of image processing and analysis. [Vision based control]
24	Civil applications of Remotely Piloted Aircraft (drones). Types of drones. [Aerial robots]
25	The Aerial Robot Loop (components, description). [Aerial robots]
26	Control techniques of drones (classical, optimal control, robust control, nonlinear control, intelligent control). [Aerial robots]
27	Characteristics of white Gaussian noise. [Sensor integration]
28	Assumptions and operations of Kalman Filter. [Sensor integration]
29	Linearization method in Extended Kalman Filter. [Sensor integration]
30	Combinatorial and sampling planning methods. [Navigation and motion planning in robotics]
31	Geometric and kinodynamic planning. Planning in view of the optimal control paradigm. [Navigation and motion planning in robotics]
32	Environment description methods for motion planning purposes. [Navigation and motion planning in robotics]
33	Differential flatness systems and their methods of control. [Nonlinear control systems]
34	Examples of differential flatness systems. [Nonlinear control systems]
35	Systems described on Lie groups and their control and related examples. [Nonlinear control systems]
36	Methods of describing position and orientation in three-dimensional space. [Control of flying robots]
37	Limitations on the use of inverse dynamics methods in the control of flying robots. [Control of flying robots]
38	Methods of obtaining state variables inaccessible directly from sensors. [Control of flying robots]
39	Basic properties and characteristics of electronic systems of flying vehicles. [Electronic systems of flying vehicles]
40	Fundamentals of metrology and basic knowledge of general navigation and flight planning. [Flight planning]