1. Record Nr. UNINA9910143716603321

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Titolo	Robot brains [[electronic resource]] : circuits and systems for conscious machines / / Pentti O. Haikonen
Pubbl/distr/stampa	Chichester, England, : John Wiley, 2007
ISBN	1-280-97414-1 9786610974146 0-470-51787-5 0-470-51786-7
Edizione	[1st edition]
Descrizione fisica	1 online resource (225 p.)
Disciplina	629.8/9263
Soggetti	Robotics Conscious automata
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. [203]-207) and index.
Nota di contenuto	Robot Brains; Contents; Preface; 1 Introduction; 1.1 General intelligence and conscious machines; 1.2 How to model cognition?; 1.3 The approach of this book; 2 Information, meaning and representation; 2.1 Meaning and the nonnumeric brain; 2.2 Representation of information by signal vectors; 2.2.1 Single signal and distributed signal representations; 2.2.2 Representation of graded values; 2.2.3 Representation of significance; 2.2.4 Continuous versus pulse train signals; 3 Associative neural networks; 3.1 Basic circuits; 3.1.1 The associative function; 3.1.2 Basic neuron models 3.1.3 The Haikonen associative neuron3.1.4 Threshold functions; 3.1.5 The linear associator; 3.2 Nonlinear associators; 3.2.1 The nonlinear associative neuron group; 3.2.2 Simple binary associator; 3.2.3 Associator with continuous weight values; 3.2.4 Bipolar binary associator; 3.2.5 Hamming distance binary associator; 3.2.6 Enhanced Hamming distance binary associator; 3.2.7 Enhanced simple binary associator; 3.3 Interference in the association of signals and vectors; 3.4 Recognition and classification by the associative neuron group; 3.5 Learning; 3.5.1 Instant Hebbian learning 3.5.2 Correlative Hebbian learning3.6 Match, mismatch and novelty;

3.7 The associative neuron group and noncomputable functions; 4 Circuit assemblies; 4.1 The associative neuron group; 4.2 The inhibit neuron group; 4.3 Voltage-to-single signal (V/SS) conversion; 4.4 Single signal-to-voltage (SS/V) conversion; 4.5 The 'Winner-Takes-All' (WTA) circuit; 4.6 The 'Accept-and-Hold' (AH) circuit; 4.7 Synaptic partitioning; 4.8 Serial-to-parallel transformation; 4.9 Parallel-to-serial transformation; 4.10 Associative Predictors and Sequencers; 4.11 Timing circuits; 4.12 Timed sequence circuits
4.13 Change direction detection5 Machine perception; 5.1 General principles; 5.2 Perception and recognition; 5.3 Sensors and preprocesses; 5.4 Perception circuits; the perception/response feedback loop; 5.4.1 The perception of a single feature; 5.4.2 The dynamic behaviour of the perception/response feedback loop; 5.4.3 Selection of signals; 5.4.4 Perception/response feedback loops for vectors; 5.4.5 The perception/response feedback loop as predictor; 5.5 Kinesthetic perception; 5.6 Haptic perception; 5.7 Visual perception; 5.7.1 Seeing the world out there; 5.7.2 Visual preprocessing
5.7.3 Visual attention and gaze direction5.7.4 Gaze direction and visual memory; 5.7.5 Object recognition; 5.7.6 Object size estimation; 5.7.7 Object distance estimation; 5.7.8 Visual change detection; 5.7.9 Motion detection; 5.8 Auditory perception; 5.8.1 Perceiving auditory scenes; 5.8.2 The perception of separate sounds; 5.8.3 Temporal sound pattern recognition; 5.8.4 Speech recognition; 5.8.5 Sound direction perception; 5.8.6 Sound direction detectors; 5.8.7 Auditory motion detection; 5.9 Direction sensing; 5.10 Creation of mental scenes and maps; 6 Motor actions for robots
6.1 Sensorimotor coordination

Sommario/riassunto

Haikonen envisions autonomous robots that perceive and understand the world directly, acting in it in a natural human-like way without the need of programs and numerical representation of information. By developing higher-level cognitive functions through the power of artificial associative neuron architectures, the author approaches the issues of machine consciousness. Robot Brains expertly outlines a complete system approach to cognitive machines, offering practical design guidelines for the creation of non-numeric autonomous creative machines. It details topics such as component