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Nota di contenuto	Temporal Patterns in Artificial Reaction Networks -- Properties of the Hopfield Model with Weighted Patterns -- Dynamics and Oscillations of GHNNs with Time-Varying Delay -- A Dynamic Field Architecture for the Generation of Hierarchically Organized Sequences -- Stochastic Techniques in Influence Diagrams for Learning Bayesian Network Structure -- The Mix-Matrix Method in the Problem of Binary Quadratic Optimization -- A Rule Chaining Architecture Using a Correlation Matrix Memory -- A Generative Multiset Kernel for Structured Data -- Spectral Signal Unmixing with Interior-Point Nonnegative Matrix

Factorization -- Hybrid Optimized Polynomial Neural Networks with Polynomial Neurons and Fuzzy Polynomial Neurons -- Tikhonov-Type Regularization for Restricted Boltzmann Machines -- Modeling of Spiking Analog Neural Circuits with Hebbian Learning, Using Amorphous Semiconductor Thin Film Transistors with Silicon Oxide Nitride Semiconductor Split Gates -- Real-Time Simulations of Synchronization in a Conductance-Based Neuronal Network with a Digital FPGA Hardware-Core -- Impact of Frequency on the Energetic Efficiency of Action Potentials -- A Large-Scale Spiking Neural Network Accelerator for FPGA Systems -- Silicon Neurons That Compute -- A Communication Infrastructure for Emulating Large-Scale Neural Networks Models -- Pair-Associate Learning with Modulated Spike-Time Dependent Plasticity -- Associative Memory in Neuronal Networks of Spiking Neurons: Architecture and Storage Analysis -- Bifurcating Neurons with Filtered Base Signals -- Basic Analysis of Digital Spike Maps -- Cyfield-RISP: Generating Dynamic Instruction Set Processors for Reconfigurable Hardware Using OpenCL -- A Biophysical Network Model Displaying the Role of Basal Ganglia Pathways in Action Selection -- How Degrading Networks Can Increase Cognitive Functions -- Emergence of Connectivity Patterns from Long-Term and Short-Term Plasticities -- Artificial Neural Networks and Data Compression Statistics for the Discrimination of Cultured Neuronal Activity -- Liquid Computing in a Simplified Model of Cortical Layer IV: Learning to Balance a Ball -- Timing Self-generated Actions for Sensory Streaming -- The Capacity and the Versatility of the Pulse Coupled Neural Network in the Image Matching -- A Novel Bifurcation-Based Synthesis of Asynchronous Cellular Automaton Based Neuron -- Biomimetic Binaural Sound Source Localisation with Ego-Noise Cancellation -- A Biologically Realizable Bayesian Computation in a Cortical Neural Network -- Evaluating the Effect of Spiking Network Parameters on Polychronization -- Classification of Distorted Patterns by Feed-Forward Spiking Neural Networks -- Spike Transmission on Diverging/Converging Neural Network and Its Implementation on a Multilevel Modeling Platform -- Differential Entropy of Multivariate Neural Spike Trains -- Learning Representations for Animated Motion Sequence and Implied Motion Recognition -- Exploratory Behaviour Depends on Multisensory Integration during Spatial Learning -- Control of Biped Robot Joints' Angles Using Coordinated Matsuoka Oscillators -- Self-calibrating Marker Tracking in 3D with Event-Based Vision Sensors -- Integration of Static and Self-motion-Based Depth Cues for Efficient Reaching and Locomotor Actions -- A Proposed Neural Control for the Trajectory Tracking of a Nonholonomic Mobile Robot with Disturbances -- Simulating Light Adaptation in the Retina with Rod-Cone Coupling -- Evolving Neural Networks for Orientation Behavior of Sand Scorpions towards Prey -- Evolving Dendritic Morphology and Parameters in Biologically Realistic Model Neurons for Pattern Recognition -- Neural Network Providing Integrative Perception of Features and Subsecond Temporal Parameters of Sensory Stimuli -- An Effect of Short and Long Reciprocal Projections on Evolution of Hierarchical Neural Networks -- Some Things Psychopathologies Can Tell Us about Consciousness -- Elastic Graph Matching on Gabor Feature Representation at Low Image Resolution -- Contour Detection by CORF Operator -- Hybrid Ensembles Using Hopfield Neural Networks and Haar-Like Features for Face Detection -- Face Recognition with Disparity Corrected Gabor Phase Differences -- Visual Categorization Based on Learning Contextual Probabilistic Latent Component Tree -- Biological Brain and Binary Code: Quality of Coding for Face Recognition -- Making a Reinforcement Learning Agent Believe

-- Biologically Plausible Multi-dimensional Reinforcement Learning in Neural Networks -- Adaptive Neural Oscillator with Synaptic Plasticity Enabling Fast Resonance Tuning -- Learning from Delayed Reward und Punishment in a Spiking Neural Network Model of Basal Ganglia with Opposing D1/D2 Plasticity -- Understanding the Role of Serotonin in Basal Ganglia through a Unified Model -- Learning How to Select an Action: A Computational Model -- A Dynamic Binding Mechanism for Retrieving and Unifying Complex Predicate-Logic Knowledge -- Estimation of Causal Orders in a Linear Non-Gaussian Acyclic Model: A Method Robust against Latent Confounders -- Reservoir Sizes and Feedback Weights Interact Non-linearly in Echo State Networks -- Learning to Imitate YMCA with an ESN -- A New Neural Data Analysis Approach Using Ensemble Neural Network Rule Extraction -- Bayesian Inference with Efficient Neural Population Codes -- Learning Sequence Neighbourhood Metrics -- Learning Features and Predictive Transformation Encoding Based on a Horizontal Product Model -- Regulation toward Self-organized Criticality in a Recurrent Spiking Neural Reservoir -- Adaptive Learning of Linguistic Hierarchy in a Multiple Timescale Recurrent Neural Network -- The Spherical Hidden Markov Self Organizing Map for Learning Time Series Data -- Echo State Networks for Multi-dimensional Data Clustering -- The Counter-Change Model of Motion Perception: An Account Based on Dynamic Field Theory -- Self-organized Reservoirs and Their Hierarchies -- On-Line Processing of Grammatical Structure Using Reservoir Computing -- Constructing Robust Liquid State Machines to Process Highly Variable Data Streams -- Infinite Sparse Threshold Unit Networks -- Learning Two-Layer Contractive Encodings -- Effects of Architecture Choices on Sparse Coding in Speech Recognition -- Generating Motion Trajectories by Sparse Activation of Learned Motion Primitives -- Kinetic Modelling of Synaptic Functions in the Alpha Rhythm Neural Mass Model -- Integrating Neural Networks and Chaotic Measurements for Modelling Epileptic Brain -- Dynamic Stopping Improves the Speed and Accuracy of a P300 Speller -- Adaptive SVM-Based Classification Increases Performance of a MEG-Based Brain-Computer Interface (BCI) -- Recognizing Human Activities Using a Layered Markov Architecture -- PSO for Reservoir Computing Optimization -- One-Class Classification through Optimized Feature Boundaries Detection and Prototype Reduction -- Bi-objective Genetic Algorithm for Feature Selection in Ensemble Systems -- Dual Support Vector Domain Description for Imbalanced Classification -- Learning Method Inspired on Swarm Intelligence for Fuzzy Cognitive Maps: Travel Behaviour Modelling -- A Computational Model of Motor Areas Based on Bayesian Networks and Most Probable Explanations.

Sommario/riassunto

The two-volume set LNCS 7552 + 7553 constitutes the proceedings of the 22nd International Conference on Artificial Neural Networks, ICANN 2012, held in Lausanne, Switzerland, in September 2012. The 162 papers included in the proceedings were carefully reviewed and selected from 247 submissions. They are organized in topical sections named: theoretical neural computation; information and optimization; from neurons to neuromorphism; spiking dynamics; from single neurons to networks; complex firing patterns; movement and motion; from sensation to perception; object and face recognition; reinforcement learning; bayesian and echo state networks; recurrent neural networks and reservoir computing; coding architectures; interacting with the brain; swarm intelligence and decision-making; mulitlayer perceptrons and kernel networks; training and learning; inference and recognition; support vector machines; self-organizing maps and clustering; clustering, mining and exploratory analysis;

bioinformatics; and time weries and forecasting.