Contents

Preface  v
   Alexei V. Samsonovich, Kamilla R. Jóhannsdóttir, Antonio Chella and Ben Goertzel

BICA 2010 Conference Committees  ix

Conference Papers and Extended Abstracts

Reverse Engineering the Vision System  3
   James Albus

Application Feedback in Guiding a Deep-Layered Perception Model  4
   Itamar Arel and Shay Berant

NeuroNavigator: A Biologically Inspired Universal Cognitive Microcircuit  10
   Giorgio A. Ascoli and Alexei V. Samsonovich

BINAReE: Bayesian Integrated Neural Architecture for Reasoning and Explanation  17
   Robert (Rusty) Bobrow, Paul Robertson and Robert Laddaga

   Michael Connolly Brady

A Connectionist Model of MT+/Mstd Explains Human Heading Perception in the Presence of Moving Objects  24
   N. Andrew Browning

Discovering the Visual Patterns Elicited by Human Scan-Path  25
   Andrea Carbone

An Architecture for Humanoid Robot Expressing Emotions and Personality  33
   Antonio Chella, Rosario Sorbello, Giorgio Vassallo and Giovanni Pilato

An Evolutionary Approach to Building Artificial Minds  40
   James L. Eilbert

Explanatory Aspirations and the Scandal of Cognitive Neuroscience  42
   Ross W. Gayler, Simon D. Levy and Rens Bod

An Experimental Cognitive Robot  52
   Pentti O.A. Haikonen

Dopamine and Self-Directed Learning  58
   Seth Herd, Brian Mingus and Randall O’Reilly

Modelling Human Memory in Robotic Companions for Personalisation and Long-Term Adaptation in HRI  64
   Wan Ching Ho, Kerstin Dautenhahn, Mei Yii Lim and Kyron Du Casse
Assessing the Role of Metacognition in GMU BICA  
*M. Q. Kalish, A. V. Samsonovich, M. A. Coletti and K. A. De Jong*  
72

Towards Understanding Trust Through Computational Cognitive Modeling  
*W. G. Kennedy*  
78

An Externalist and Fringe Inspired Cognitive Architecture  
*R. Manzotti*  
79

Architecture of the Mind with Artificial Neurons  
*D. J. Nath*  
85

Online Event Segmentation in Active Perception Using Adaptive Strong Anticipation  
*B. Nery and R. Ventura*  
86

Four Kinds of Learning in One Agent-Oriented Environment  
*S. Nirenburg, M. McShane, S. Beale, J. English and R. Catizone*  
92

Attention in the ASMO Cognitive Architecture  
*R. Novianto, B. Johnston and M.-A. Williams*  
98

On the Emergence of Novel Behaviours from Complex Non Linear Systems  
*L. Riano and T. M. McGinnity*  
106

GRAVA – Context Programming  
*P. Robertson and R. Laddaga*  
113

Implementing First-Order Variables in a Graphical Cognitive Architecture  
*P. Rosenbloom*  
119

Cathexis: An Emotional Basis for Human-Like Learning  
*M. Sellers*  
125

Biological and Psycholinguistic Influences on Architectures for Natural Language Processing  
*J. F. Sowa*  
131

A Bio-Inspired Model for Executive Control  
*N. Srinivas and S. E. Chelian*  
137

Neural Symbolic Decision Making: A Scalable and Realistic Foundation for Cognitive Architectures  
*T. C. Stewart and C. Eliasmith*  
147

The Role of the Basal Ganglia – Anterior Prefrontal Circuit as a Biological Instruction Interpreter  
*A. Stocco, C. Lебiere, R. C. O'Reilly and J. R. Anderson*  
153

Learning to Recognize Objects in Images Using Anisotropic Nonparametric Kernels  
*D. Summers-Stay and Y. Aloimonos*  
163
Disciple Cognitive Agents: Learning, Problem Solving Assistance, and Tutoring
Gheorghe Tecuci, Mihai Boicu, Dorin Marcu and David Schum

Attention Focusing Model for Nexting Based on Learning and Reasoning
Akshay Vashist and Shoshana Loeb

A Neurologically Plausible Artificial Neural Network Computational Architecture of Episodic Memory and Recall
Craig M. Vineyard, Michael L. Bernard, Shawn E. Taylor, Thomas P. Caudell, Patrick Watson, Stephen Verzi, Neal J. Cohen and Howard Eichenbaum

Validating a High Level Behavioral Representation Language (HERBAL): A Docking Study for ACT-R
Changkun Zhao, Jaehyon Paik, Jonathan H. Morgan and Frank E. Ritter

Manifesto
Introducing the BICA Society
Alexei V. Samsonovich, Kamilla R. Jóhannsdóttir, Andrea Stocco and Antonio Chella

Review
Toward a Unified Catalog of Implemented Cognitive Architectures
Alexei V. Samsonovich

Subject Index
245
Author Index
247