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ISBN	1-283-85621-2 0-19-165428-0
Descrizione fisica	1 online resource (158 p.)
Disciplina	571.43 571.634
Soggetti	Biology - Simulation methods Biology - Mathematical models
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 and index.
Nota di contenuto	Cover; Contents; 1 Introduction; Chapter summary; Further reading; 2 Chemotaxis in bacterium Escherichia coli; 2.1 Chemical gradient sensing; 2.2 "Nose and brain": the receptor cluster; 2.3 E. coli chemotaxis pathway; 2.4 Experimental approaches; 2.5 Time-course data and dose-response curves; Chapter summary; Further reading; 3 Physical concepts; 3.1 Diffusion; 3.2 Boltzmann distribution; 3.3 Ligand-receptor binding; 3.4 Fluctuation-dissipation theorem; Chapter summary; Further reading; 4 Mathematical tools; 4.1 Ordinary differential equations; 4.2 Kinetic laws; 4.3 Master equation 4.4 Poisson distribution4.5 Waiting-time distribution; 4.6 Langevin small-noise approximation; 4.7 Information theory; Chapter summary; Further reading; 5 Signal amplification and integration; 5.1 Cooperativity by allostery; 5.2 Emergence of allostery from microscopic details; 5.3 Two-state equilibrium receptor model; 5.4 Monod-Wyman-Changeux model for receptor signaling; 5.5 Alternative Ising model for receptor cluster; Chapter summary; Further reading; 6 Robust precise adaptation; 6.1 Energy-landscape picture of adaptation; 6.2 Dynamics of adaptation; 6.3 Chemotactic response function 6.4 Integral-feedback control6.5 Assistance neighborhoods; Chapter summary; Further reading; 7 Polar receptor localization and clustering; 7.1 Trimer of dimers; 7.2 Elastic cluster-membrane model; 7.3 Polar

receptor clustering; Chapter summary; Further reading; 8 Accuracy of sensing; 8.1 Perfectly absorbing sphere; 8.2 Perfectly monitoring sphere; 8.3 Sensing with cell-surface receptors; Chapter summary; Further reading; 9 Motor impulse response; 9.1 Impulse response; 9.2 Time and frequency domains; 9.3 Minimal pathway model; 9.4 Linear response approximation; 9.5 Noise power spectra  
Chapter summary; Further reading; 10 Optimization of pathway; 10.1 Optimal receptor-complex size; 10.2 Optimal adaptation dynamics; Chapter summary; Further reading; 11 "Seeing like a bacterium"; 11.1 Typical chemical gradients; 11.2 Weber's law; 11.3 Perception; 11.4 Fold-change detection; 11.5 Matching relations; 11.6 Predicting typical stimuli; Chapter summary; Further reading; 12 Beyond E. coli chemotaxis; Chapter summary; Further reading; Appendix More techniques; A.1 Derivation of the fluctuation-dissipation theorem; A.2 Variational principles and the Euler-Lagrange equation  
A.3 Gillespie simulations; A.4 Fokker-Planck approximation; A.5 Derivation of the Langevin noise; A.6 Time versus frequency domain; A.7 Model fitting to data; A.8 Principal component analysis; Chapter summary; Further reading; Index; A; B; C; D; E; F; G; H; I; L; M; N; O; P; Q; R; S; T; V; W

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## Sommario/riassunto

Although invisible to the bare eye, bacterial cells are large enough to make complex decisions. Cells are composed of thousands of different molecular species including DNA, proteins, and smaller molecules, allowing them to sense their environment, to process this information, and to respond accordingly. Such responses include expression of genes or the control of their movement. Despite these properties, a living cell exists in the physical world and follows its laws. Keeping this in mind can help answer questions such as how cells work and why they implement solutions to problems the way they

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2. Record Nr.	UNINA9910144205703321
Titolo	Diagrammatic Representation and Inference : Third International Conference, Diagrams 2004, Cambridge, UK, March 22-24, 2004, Proceedings // edited by Alan Blackwell, Kim Marriott, Atsushi Shimojima
Pubbl/distr/stampa	Berlin, Heidelberg : , : Springer Berlin Heidelberg : , : Imprint : Springer, , 2004
ISBN	1-280-30801-X 9786610308019 3-540-25931-7
Edizione	[1st ed. 2004.]
Descrizione fisica	1 online resource (XVI, 456 p.)
Collana	Lecture Notes in Artificial Intelligence ; ; 2980
Disciplina	006.6
Soggetti	Application software Computer science Computer Applications Computer Science, general
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Diagrams in the Mind and in the World: Relations between Internal and External Visualizations -- Can Diagrams Have Epistemic Value? The Case of Euclid -- Inferential and Expressive Capacities of Graphical Representations: Survey and Some Generalizations -- On Frege's Logical Diagrams -- Psychological Foundations for Concept Modeling -- On Differences between the Real and Physical Plane -- Query Graphs with Cuts: Mathematical Foundations -- Towards a Default Reading for Constraint Diagrams -- Drawing Graphs in Euler Diagrams -- Diagrams and Non-monotonicity in Puzzles -- Peirce's Diagrammatic Logic in IF Perspective -- What Can Spider Diagrams Say? -- Ensuring the Drawability of Extended Euler Diagrams for up to 8 Sets -- On Extending Venn Diagram by Augmenting Names of Individuals -- Reasoning with Projected Contours -- An Architecture for Problem Solving with Diagrams -- Generating Readable Proofs: A Heuristic Approach to Theorem Proving With Spider Diagrams -- Automated

Model Transformation and Its Validation Using AToM3 and AGG -- Inter-diagrammatic Reasoning and Digital Geometry -- A Prototype Inference Engine for Rule-Based Geometric Reasoning -- Automatic Proofs for Scalecharts -- Diagram Schemas: What, Why, How -- Roles of Diagrammatic Information for the Discovery of Geometrical Theorems -- Interpreting Imprecise Diagrams -- Why Diagrams Are (Sometimes) Six Times Easier than Words: Benefits beyond Locational Indexing -- Incorporating Perceptual Task Effort into the Recognition of Intention in Information Graphics -- Individual Differences in Graphical Reasoning -- Co-ordinating Conventions in Graphical Dialogue: Effects of Repetition and Interaction -- Predictors of Success in Diagrammatic Problem Solving -- Speech and Graphical Interaction in Multimodal Communication -- Generating New Research Hypotheses from a Result Diagram of Qualitative Research -- Interpreting Lines in Graphs: Do Graph Users Construe Fictive Motion? -- Learning with Diagrams: Effects on Inferences and the Integration of Information -- Making TRACS: The Diagrammatic Design of a Double-Sided Deck -- A Cognitive Processing Perspective on Student Programmers' 'Graphicacy' -- Using Graphics to Communicate Across Cultures -- The Effect of Knowledge-of-External-Representations upon Performance and Representational Choice in a Database Query Task -- User-Controllable Animated Diagrams: The Solution for Learning Dynamic Content? -- Processing Animation: Integrating Information from Animated Diagrams -- A Training Program to be Perceptually Sensitive and Conceptually Productive through Meta-cognition: A Case Study -- Can Object (Instance) Diagrams Help First Year Students Understand Program Behaviour? -- Spatial Transformations in Graph Comprehension -- Constructing Diagrams Representing Group Motions -- Bar-Gain Boxes: An Informative Illustration of the Pairing Problem -- Bayesian Boxes: A Colored Calculator for Picturing Posteriors -- Representing Rosters: Conceptual Integration Counteracts Visual Complexity -- Visualization Techniques for Product Change and Product Modelling in Complex Design -- Geographic Projection of Cluster Composites -- Decision Diagrams in Machine Learning: An Empirical Study on Real-Life Credit-Risk Data -- Feature Diagrams in Phonology -- Using Color Component Overlays for Result Visualization in a Classification by Sketch System -- Teaching Children Brackets by Manipulating Trees: Is Easier Harder? -- Cider: A Component-Based Toolkit for Creating Smart Diagram Environments -- Diagrammatic Spreadsheet: An Overview -- Perceptual Support of Diagram Creation and Editing -- ScanScribe: Perceptually Supported Diagram Image Editing -- An Experimental Comparison of Diagrammatic and Algebraic Logics -- Automatic Generation of the Behavior Definition of Distributed Design Tools from Task Method Diagrams and Method Flux Diagrams by Diagram Composition -- Selected Aspects of Customization of Cognitive Dimensions for Evaluation of Visual Modeling Languages -- Notations for Software Engineering Class Structures.

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## Sommario/riassunto

Although diagrammatic representations have been a feature of human communication from early history, recent advances in printing and electronic media technology have introduced increasingly sophisticated visual representation into everyday life. We need to improve our understanding of the role of diagrams and sketches in communication, cognition, creative thought, and problem-solving. These concerns have triggered a surge of interest in the study of diagrammatic notations, especially in academic disciplines dealing with cognition, computation, and communication. We believe that the study of diagrammatic

communication is best pursued as an interdisciplinary endeavor. The Diagrams conference series was launched to support an international research community with this common goal. After successful meetings in Edinburgh (2000) and Georgia (2002), Diagrams 2004 was the third event in the series. The Diagrams series attracts a large number of researchers from virtually all academic fields who are studying the nature of diagrammatic representations, their use in human communication, and cognitive or computational mechanisms for processing diagrams.

By combining several earlier workshop and symposium series that were held in the US and Europe – Reasoning with Diagrammatic Representations (DR), US; Thinking with Diagrams (TWD), Europe; and Theory of Visual Languages (TVL), Europe – Diagrams has emerged as a major international conference on this topic.

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