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Learning Techniques -- Towards Discovery of Deep and Wide First-Order Structures: A Case Study in the Domain of Mutagenicity -- Eliminating Useless Parts in Semi-structured Documents Using Alternation Counts -- Multicriterially Best Explanations -- Constructing Approximate Informative Basis of Association Rules -- Passage-Based Document Retrieval as a Tool for Text Mining with User's Information Needs -- Automated Formulation of Reactions and Pathways in Nuclear Astrophysics: New Results -- An Integrated Framework for Extended Discovery in Particle Physics -- Stimulating Discovery -- Assisting Model-Discovery in Neuroendocrinology -- A General Theory of Deduction,Induction,and Learning -- Learning Conformation Rules -- Knowledge Navigation on Visualizing Complementary Documents -- KeyWorld:Extracting Keywords from Document s Small World -- A Method for Discovering Purified Web Communities -- Divide and Conquer Machine Learning for a Genomics Analogy Problem -- Towards a Method of Searching a Diverse Theory Space for Scientific Discovery -- Effcient Local Search in Conceptual Clustering -- Computational Revision of Quantitative Scientific Models -- An Efficient Derivation for Elementary Formal Systems Based on Partial Unification -- Worst-Case Analysis of Rule Discovery -- Mining Semi-structured Data by Path Expressions -- Theory Revision in Equation Discovery -- Simplified Training Algorithms for Hierarchical Hidden Markov Models -- Discovering Repetitive Expressions and Affinities from Anthologies of Classical Japanese Poems -- Poster Papers -- Web Site Rating and Improvement Based on Hyperlink Structure -- A Practical Algorithm to Find the Best Episode Patterns -- Interactive Exploration of Time Series Data -- Clustering Rules Using Empirical Similarity of Support Sets -- Computational Lessons from a Cognitive Study of Invention -- Component-Based Framework for Virtual Information Materialization -- Dynamic Aggregation to Support Pattern Discovery: A Case Study with Web Logs -- Separation of Photoelectrons via Multivariate Maxwellian Mixture Model -- Logic of Drug Discovery: A Descriptive Model of a Practice in Neuropharmacology -- SCOOP: A Record Extractor without Knowledge on Input -- Meta-analysis of Mutagenes Discovery.

| Sommario/riassunto | These are the conference proceedings of the 4th International Conference on Discovery Science (DS 2001). Although discovery is naturally ubiquitous in s- ence, and scientific discovery itself has been subject to scientific investigation for centuries, the term Discovery Science is comparably new. It came up in conn- tion with the Japanese Discovery Science project (cf. Arikawa's invited lecture on The Discovery Science Project in Japan in the present volume) some time during the last few years. Setsuo Arikawa is the father in spirit of the Discovery Science conference series. He led the above mentioned project, and he is currently serving as the chairman of the international steering committee for the Discovery Science c- ference series. The other members of this board are currently (in alphabetical order) Klaus P. Jantke, Masahiko Sato, Ayumi Shinohara, Carl H. Smith, and Thomas Zeugmann. Colleagues and friends from all over the world took the opportunity of me- ing for this conference to celebrate Arikawa's 60th birthday and to pay tribute to his manifold contributions to science, in general, and to Learning Theory and Discovery Science, in particular. Algorithmic Learning Theory (ALT, for short) is another conference series initiated by Setsuo Arikawa in Japan in 1990. In 1994, it amalgamated with the conference series on Analogical and Inductive Inference (AII), when ALT was held outside of Japan for the first time. |