

UNIVERSIDAD DE BUENOS AIRES

FACULTAD DE CIENCIAS EXACTAS Y NATURALES

DEPARTAMENTO: Computación.....

ASIGNATURA:

CARRERA/S: ..Lic.en.Ciencias.de.la.Computación.(18).(87).....

.....

CARACTER: ..optativa.....(indicar si es obligatoria u optativa)

PUNTAJE: ..3.(tres).....(en caso de ser optativa)

DURACION DE LA MATERIA: ..cuatrimestral.....(indicar si es cuatrimestral o anual).

HORAS DE CLASE: a) TEORICAS...3.. HS. b) PROBLEMAS HS.
c) LABORATORIO... HS. d) SEMINARIOS..... HS.
e) TOTALES....3.. HS.

ASIGNATURAS

CORRELATIVAS: ..Inteligencia.Artificial.....
.....

PROGRAMA:

Unidad 1: INTRODUCCION AL APRENDIZAJE AUTOMATICO.

Introducción, definición, conceptos generales.Orientaciones de las investigaciones. Clasificaciones de los modelos de aprendizaje. Aprendizaje Humano vs Aprendizaje Automático.Reseña Histórica.

Unidad 2: INDUCCION DE ARBOLES DE DECISION.

Introducción. El proceso de Inducción . Algoritmo ID3 (Quinlan). Modelo de confianza para grandes universos. Modificación de ID3 para grandes conjuntos de entrenamientos . Prunning y Algoritmo C4. Control de ruido.

Unidad 3: TEORIA Y METODOLOGIA DEL APRENDIZAJE INDUCTIVO.

Conceptos generales. Aprendizaje como Búsqueda Heurística . Un paradigma general. Adquisición de Conceptos vs Generalizaciones Descriptivas. Completitud y consistencia. Generalización, reglas. Conocimiento de dominio. Espacio de versiones. Algoritmo STAR, INDUCE (Dietterich). Distintas Heurísticas de Búsqueda.

Unidad 4: APRENDIZAJE POR OBSERVACION.

Conceptos generales. Generalizaciones Descriptivas. Aprendizaje no supervisado . Agrupamiento conceptual.

Unidad 5: APRENDIZAJE POR EXPERIMENTACION.

Aprender por la práctica .Sistema Lex. Sistemas Expertos que aprenden con la experiencia.

Unidad 6: APRENDIZAJE POR DESCUBRIMIENTO.

Conceptos generales. Aprendizaje de múltiple conceptos. Manejo conjunto de diversos formalismos de representación. Sisrema AM (Lehat).

Unidad 7: APRENDIZAJE POR ANALOGIA.

Conceptos generales. Detección de similitudes .Detección de información relevante.Organización de la bases de conocimientos.Algoritmos de búsqueda, heurísticas.

Unidad 8: APRENDIZAJE POR BUSQUEDA DE EXPLICACIONES.

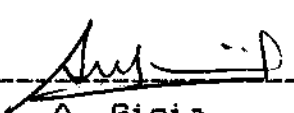
Uso de teorías sobre el dominio . Generalización Basda en Explicaciones. Modelo EBL.

Unidad 9: OTROS MODELOS Y CONCLUSIONES.

Otros modelos de aprendizaje. Formalismos de aprendizaje. Aplicaciones en Programación Automática. Discusiones y conclusiones.

Fecha: 15 de setiembre de 1989.



A. Kvitca
Prof. Responsable

A. Gioia
Autoridad del Depto.

Bibliografía

Referencias Generales

- AIH-III Cohen, Feigenbaum, AI Handbook Vol III
 KODRA-ASA Kodratoff Yves, Lecons d'Apprentissage Symbolique
 Automatique, Cepadues-Editions, Toulouse '86
 MLCR-86s Varios, Currents Research in Machine Learning, M, C, M
 Editors, 1986
 ML-I Varios, Machine Learning: An Intelligence Artificial
 Approach Vol. I. M, C, M Editors. Tioga Publishing Co, Palo
 Alto, Ca '83
 ML-II Varios, Machine Learning: An Intelligence Artificial
 Approach Vol II. M, C, M Editors. Tioga Press, Palo Alto,
 Ca '84
 CACM Communications of ACM
 JACM Journal of ACM
 ACMCS ACM Computing Surveys
 PIJCAI Proceedings of International Artificial Intelligence
 AIJ Artificial Intelligence Journal
 AIM AI Magazine
 DSS Decision Support Systems
 IJMS International Journal of Man-Machine Studies
 CSJ Cognitive Science Journal
 AI Artificial Intelligence
 MLJ Machine Learning Journal
 Unidad 1: Introducción al Aprendizaje Automático
 CARBO-83a Carbonell J, Michalki R, Mitchell T. An Overview of Machine
 Learning. ML-I :01:3-24
 SIMON-83 Simon Herbert. Why Should Machines Learn? ML-I :02: 25-38
 MICHAL-86a Michalski R. Understanding the Nature of Learning: Issues
 and Researchs... ML-II:01:3-26
 MICHAL-86c Michalski, Amarel, Lenat, Michie, Winston. Machine
 Learning: Challenges of Eighties. ML-II:02: 27-42
 KODRA-MC Kodratoff Yves. Cuando el Ordenador Aprende. MC:53:1268-74;
 ??? '85
 LANGL-83c Langley Pat. Representational Issues un Learning Systems.
 IEEE-Expert :83/10: 47-51
 PHELPS-85 Phelps B, Musgrove P. A Prototypical Approach to Machine
 Learning. PIJCAI-85 : 698-700
 SLOMAN-85 Sloman Aaron. What enables a machine to understand?.
 PIJCAI-85 : 965-1001
 HELFT-ECI Helft Nicolas. Modelos Computacionales de Aprendizaje.
 ECI:87:p20
 KAHN-86 Kahn Gary. Knowledge Acquisition: Investigations and
 General Principles. MLCR-86:119-23
 VALIAN-86 Valiant LG. What Can be Learned? MLCR-86:349-53

AIH-14A Feigenbaum, Cohen. Learning and Inductive Inference - Overview. AIH-III:3:14-A:325
 KODRA-ASA1 Kodratoff Yves. Pourquoi parler d'apprentissage automatique et d'IA. KODRA-ASA : 1:15
 RICH-ML Rich Elaine. Learning. RICH-AI:11:361-388
 NORMAN-ADI Norman Donald. La Adquisicion de Informacion en el Hombre. NORMAN-PIH:03:
 CHARNI-ML Charniak, McDermott. Learning. CHARNI-AI :11:609-62
 BUCHA-86 Buchanan Bruce. Some Approaches to Knowledge Acquisition. MLCR-86: 19-24
 HAAS-86 Haas N, Hendrix S. Learning by Being Told: Acquiring K for Information Management. ML-I :13:405-428
 AIH-14B Feigenbaum, Cohen. Rote Learning. AIH-III:3:14-B:335-
 AIH-14C Feigenbaum, Cohen. Learning by Taking Advice. AIH-III:3:14-B:335-

Unidad 2: Inducción de Arboles de decisión

QUINL-86b Quinlan JR. Induction of Decision Trees. MLJ:01:01: 81-106, Jul '86
 QUINL-83 Quinlan JR. Learning Efficient Classification Procedures and their applications. ML-I :15:463-482
 CUENA-ML Cuena Jose. Adquisicion de Conoc. y Aprendizaje en Sistemas Basados en Reglas. CUENA-IA:05:111-43
 AIH-14D Feigenbaum, Cohen. Learning From Examples AIH-III:3:14-D:360-
 O'KEEFE-83 O'Keefe Richard. Concept Learning from Very Large Training Sets. PIJCAI-83 : 479-81
 THOMP-86 Thompson B, Thompson W. Finding Rules in Data. BYTE :86/11:149-57

Unidad 3: Teoría y Metodología del Aprendizaje Inductivo

DIETT-83 Dietterich T, Michalski R. A Comparative Review of Selected Methods for L from Examples. ML-I :03: 39-82
 MICHAL-83a Michalski RA. Theory and Methodology of Inductive Learning. ML-I :04: 83-104
 ANGLU-83 Angluin D, Smith C. Inductive Inference: Theory and Methods. ACMCS:15:03:237-69, sep'83
 WINST-86a Winston PH. Learning by Augmenting Rules and Accumulating Censors. ML-II:03: 45-62
 DIETT-86 Dietterich T, Michalski R. Learning to Predict Sequences. ML-II:04: 63-106
 UTGOFF-86 Utgoff Paul. Shift Bias for Inductive Concept Learning. ML-II:05:107-148
 SAMMUT-86a Sammut C, Banerji R. Learning Concepts by Asking Questions. ML-II:07:167-192
 HAYES-78 Hayes-Roth F, McDermott J. An Inference Matching Technique for Inducing Abstractions. CACM :21:05:401-11, may'78

SHAW-87 Shaw Michael. Applying Inductive Learning to Enhance Knowledge-based ES. DDS:03:00:319-33, '87

ARBAB-85 Arbab B, Michie D. Generating Rules From Examples. PIJCAI-85 : 631-3

CUENA-ML Cuena Jose. Adquisicion de Conoc. y Aprendizaje en Sistemas Basados en Reglas. CUENA-IA:05:111-43

CARTER-87 Carter Chris, Catlett Jason. Assessing Credit Card Applications Using Machine Learning. IEEE-Expert :87/09: 71-9

SALZBERG-85 Salzberg Steven. Heuristics for Inductive Learning. PIJCAI-85 : 604-8

SILVER-83 Silver Bernard. Learning Equation Solving Methods from Examples. PIJCAI-83 : 429-31

DIETTERICH-79 Dietterich T, Michalski R. Learning and Generalization of Characteristic Descriptions... PIJCAI-79 : 223-31

SEGEN-86 Segen Jakub. Learning Concept Descriptions From Examples With Errors. PIJCAI-85 : 634-6

MOZETIC-86 Mozetic Igor. Knowledge Extraction Through Learning From Examples. MLCR-86:227-33

RENDEL-86 Rendell Larry. A Scientific Approach to Practical Induction. MLCR-86:267-73

AIH-140 Feigenbaum, Cohen. Learning From Examples. AIH-III:3:14-D:360-

RENDEL-85 Rendell Larry. Substantial Constructive Induction Using Layered Information ... PIJCAI-85 : 650-8

O'KEEFE-83 O'Keefe Richard. Concept Learning from Very Large Training Sets. PIJCAI-83 : 479-81

THOMPSON-86 Thompson B, Thompson W. Finding Rules in Data. BYTE :86/11:149-57

Unidad 4: Aprendizaje por Observación

LENAT-83 Lenat Douglas. Learning from Observation and Discovery. ML-I :09:243-306

MICHALSKI-83b Michalski R, Stepp R. Learning from Observation: Conceptual Clustering. ML-I :11:331-364

LANGLEY-86b Langley, Zytkow, Simon, Bradshaw. The Search for Regularity: Four Aspects of Scientific Discovery. ML-II:16:425-470

STEPP-86b Stepp R, Michalski R. Conceptual Clustering: Inventing Goal Oriented Classification. ML-II:17:471-498

AMAREL-86 Amarel Samuel. Program Synthesis as a Theory Formation Task: Problem Representation. ML-II:18:499-570

DEJONG-86b Dejong Gerald. An Approach to Learning By Observation. ML-II:19:571-592

BERWICK-86 Berwick. Learning from Positive-Only Examples: The Subset Principle and... ML-II:21:625-646

ERNST-82 Ernst G, Golstein M. Mechanical Discovery of Classes of Problem Solving Strategies. JACM :29:01:1-23: jan'82

DOLAN-85 Dolan Charles. Learning Planning Heuristics through Observation. PIJCAI-85 : 600-2
 FISHER-86 Fisher Douglas. A Proposed Method of Conceptual Clustering from Structured and ... MLCR-86: 67-70
 FISHER-85 Fisher Douglas, Langley Pat. Approaches to Conceptual Clustering. PIJCAI-85 : 692-7
 STEPP-86a Stepp R. Conceptual Clustering of Structured Objects. MLCR-86:333-7
 KODRA-ASA8 Kodratoff Yves. Construction automatique de taxonomies. KODRA-ASA : 8:121

Unidad 5: Aprendizaje por Experimentación

HAYESR-83 Hayes-Roth Frederic. Using Proofs and Refutations to Learn from Experience. ML-I :08:211-240
 MITCH-83b Mitchell Tom. Learning and Problem Solving. PIJCAI-83 :1139-51
 KUIPER-79 Kuipers Benjamin. Commonsense Knowledge of Space: Learning from Experience. PIJCAI-79 : 499-501
 FU-86 Li-Min Fu. Building an Expert System that Can Learn. IEEE-Expert :86/???:303-9
 MITCH-83a Mitchell T, Utgoff P, Banerji R. Learning by Experimentation: Acquiring and Refining Problem-Solving Heuristics. ML-I :06:163-190
 KOLOD-86 Kolodner J, Simpson R. Using Experience as a Guide for Problem Solving. MLCR-86:155-61
 KODRA-ASA5 Kodratoff Yves. Apprendre par l'action. KODRA-ASA : 5:71
 KODRA-ASA6 Kodratoff Yves. Apprentissage empirique par detection des similarites. KODRA-ASA : 6:85
 AIH-14D Feigenbaum, Cohen. Learning From Examples. AIH-III:3:14-D:360-

Unidad 6: Aprendizaje por descubrimiento

LENAT-83 Lenat D. Eurisko: A Program that learns new heuristics and domains concepts. AI:21'83
 LENAT-84a Lenat D. AM: A case study in AI methodology. AIJ aug'84
 LENAT-84b Lenat D. Why AM and Eurisko appear to work. AIJ aug'84
 IBA-85 Iba Glenn. Learning by Discovering Macros in Puzzle Solving. PIJCAI-85 : 640-2
 BUNDY-85 Bundy Alan. Discovery and Reasoning in Mathematics. PIJCAI-85 :1221-30
 SIMON-86a Zytkow J, Simon H. A Theory of Historical Discovery: The Construction of Components. MLJ:01:01:107-136

Unidad 7: Aprendizaje por analogia

BURST-86 Burstein Mark. Concept Formation by Incremental Analogical Reasoning and Debugging. ML-II:13:351-370

- CARBO-86a Carbonel Jaime. Derivational Analogy: A Theory of Reconstructive Problem Solving. ML-II:14:371-392
- DERSHO-86 Dershowitz Nachum. Programming by Analogy. ML-II:15:395-420
- MCDERM-79 McDermott John. Learning to Use Analogies. PIJCAI-79 : 568-76
- WINST-80 Winston PH. Learning and Reasoning by Analogy. CACM 123:12:689-703: dec'80
- BURST-86a Burstein Mark. Analogical Learning with Multiple Models. MLCR-86: 25-8
- CARBO-83b Carbonell Jaime. Learning by Analogy: Formulating and Generalizing Plans from Past Experience. ML-I :05:137-162
- GREINER-86 Greiner Russell. Learning By Understanding Analogies. MLCR-86: 81-4
- HALL-86 Hall Rogers. Analogical Reasoning in the Context of Acquiring Problem Solving. MLCR-86: 85-8
- KEDAR-86 Kedar-Cabelli Smadar. Purpose-Directed Analogy: A Summary of Current Research. MLCR-86:123-7
- KODRA-ASA6 Kodratoff Yves. Apprentissage empirique par detection des similarites. KODRA-ASA : 6:85
- KODRA-ASA7 Kodratoff Yves. Apprentissage rationnel par detection des similarites. KODRA-ASA : 7:101
- WINST-ML Winston PH. Recognizing Analogies and Learning Simple Concepts. WINST-AI:02: 15-44

Unidad 8: Aprendizaje por búsqueda de explicaciones

- MITCH-86b Mitchell T, Keller R, Kedar-Cabelli S. Explanation-Based Generalization: A Unifying View. MLJ:01:01: 47-80: jul'86
- ELLMAN-86 Ellman Thomas. Explanation-Based Learning in Logic Circuit Design. MLCR-86: 63-7
- SEGEN-86 Segen Jakub. Learning Concept Descriptions From Examples With Errors. PIJCAI-85 : 634-6
- LEBOW-86b Lebowitz Michael. Complex L Environments Hierarchies and de use of Explanation. MLCR-86:179-82
- MOONEY-86a Mooney Raymond. Generalizing Explanations of Narratives Into Schemata. MLCR-86:207-13
- MOSTOW-PL Prieditis A, Mostow J. PROLEARN: Towards a Prolog Interpreter that Learn. PIJCAI-87 : 494-98

Unidad 9: Otros modelos y conclusiones

- ROSEMB-86a Rosebloom P, Newell A. The Chunking of Goal Hierachies: A Generalized Model of Practice. ML-II:10:247-288
- LAIRD-ML1 Laird J, Rosebloom P, Newell A. Chunking in SOAR: the Anatomy of a General Learning Mechanism. MLJ:01:01: 11-46: jul'86
- ROSEMB-86b Rosebloom, Laird, Newell, Golding, Unrush. Current Research on Learning in SOAR. MLCR-86:281-91
- VALIAN-84a Valiant LG. A Theory of the Learnable. CACM:27:11:1134-42: nov'84