

CENTRIA

Intelligent Information Systems



Contributing members 1999 - 2003

- Carlos Damásio 2002 - ...
- Irene Rodrigues 1999 - ...
- João Moura Pires 2002 - ...
- Joaquim Aparício 2002 - ...
- José Gabriel Lopes 1999-2001
- Nuno Miguel Marques 2000 - ...
- Pablo Gamallo 2000-2001
- Paulo Quaresma 1999 - ...
- Salvador Abreu 2002- ...
- Veska Noncheva 2001-2001



Other collaborators 1999-2001

- MSc Students

- 1999 – 1
 - 2000 – 1
- 2001 – 8
- 2002 – 11 – (1 completed)
- 2003 – 12 – (3 completed)

- Phd Students

- 1999 – 11
- 2000 – 11 – (1 completed)
- 2001 – 12 – (1 completed) – (9 left Centria and joined CITI)
- 2002 – 5
- 2003 – 6



Research topics

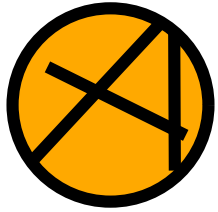
- 1999-2001
 - Natural language processing
 - Part-of-speech taggers
 - Robust parsing of text
 - Multiword lexical units
 - Parallel text alignment
 - Cooperative Information Retrieval Dialogues
 - Intelligent Information Systems
 - Documents Intelligent Clustering
 - Automatic classification of documents
 - Integration of heterogeneous databases
- 2002-2003
 - Semantic web tools:
 - KRR for the Semantic Web
 - Semantic web based integration of heterogeneous databases
 - Agents for classification of documents, and semantic web ontology definition
 - Other IIS tools:
 - **Specification and Query languages** (ISCO/ISTO/ISSO)
 - Natural Language query **dialogues**
 - Specialized tools for retrieving and processing **Portuguese-language documents.**
 - **Data Warehouse design and query**, with Computer Assisted Multidimensional Modelling (CAMM); Computer Assisted Physical Design for Multidimensional Modelling.
 - XML **web services for scheduling problems.**
 - one **View Maintenance of ORDB.**



Cooperation 1999-2003

■ International

- Université d'Orleans 1996 - 2001
- Inria-Rocquencourt 1996 - ...
- Lab Informatique Marseille 1996 - 2001
- Pontificia U.Católica, Brazil (PUCRS) 1996 - ...
- Unisinos, Porto Alegre Brazil 1996 - ...
- ITTIG - Istituto di teoria e tecniche dell'informazione giuridica. Italy 2002 - ...
- Southern Denmark University, Denmark 2002 - ...



Cooperation 1999-2003

- National

- Instituto Geológico e Mineiro 2000-2001
- Procuradoria Geral da República 1996 - ...
- Universidade de Évora 1996 - ...
- FEUP 2002 - ...
- Centro de Linguística da UNL (CLUNL) 2000 - ...



Visitors 1999-2003

- Isabelle Debourges, Université d'Orleans, France, June 1999
- Manuel Vilares Ferro, U. Vigo, Spain. 1999
- James Allen, Rochester University, USA, 1999
- Sylvie Guilloré, Université d'Orléans, France, 1999
- Gregory Grefenstette, Xerox Research Centre Europe, Grenoble Site, France, September 2000
- Paul Sabatier, Laboratoire d'Informatique de Marseille, 2000
- Daniel Diaz, University of Paris I and INRIA
- Eric de la Clergerie, INRIA-Rocquencourt, France
- Renata Vieira, UNISINOS, Porto Alegre, Brasil
- Vera Strube de Lima, UNISINOS, Porto Alegre Brasil
- Prof. Eckhard Bick. Southern Denmark University, Denmark



Projects 1999-2001

■ International

- TRADAUT-PT Automatic Translation System for public administration - European Commission and Fundação para a Ciência e Tecnologia
- Analysis and Synthesis of sentences in Portuguese and French -- Institution Scientific and Technical Institute for the International Cooperation
- FUNDAÇÕES - Multi Agent Systems and Natural Language Processing – ICCTI/CAPEs
- ORLISINROC – ORléans - Lisboa - INRIA ROCquencourt – ICCTI and French Embassy
- ELSNET - European Language and Speech Network – ESPRIT - European Commission



Projects 1999-2001

■ National

- SIIUE – Universidade de Évora's Integrated Information System - Universidade de Évora
- PGR – Selective Access to decisions of the Portuguese Attorney General – Agência de Inovação
- IGM – access to information available at OCRed reports on ore prospecting – IGM - Instituto Geológico e Mineiro
- DIXIT - Multilingual Intentional Dialogue Systems – JNICT/PRAXIS
- Medieval Portuguese Corpora – JNICT/PRAXIS
- Automatic acquisition of facts in decisions of Supreme Court for Natural Language Interrogation – FCT (ex-JNICT)



Projects 2002-2003

■ International

- DIRPI -- Desenvolvimento e Integração de Recursos para a Pesquisa de Informação GRICES/CAPES
- Extensions au Logiciel Libre GNU Prolog. INRIA/GRICES

■ National

- COOPERATIVE -- Automatic Clustering and Visualization of Legal Documents in a Cooperative Information Retrieval Web System. FCT/MCES
- ABC -- Intelligent Access to Knowledge Bases. Agência de Inovação
- AJACS -- Yet Another Java Constraint Programming System. FCT SAPIENS (POSI)
- SIIUE -- Universidade de Évora's Integrated Information System, Universidade de Évora
- GODE -- Gestão dos Orgãos e Deputados Eleitos da Assembleia da República. Portuguese Parliament
- Data Warehouse of environmental data. Protocol with the *Instituto do Ambiente* / FCT



Results 1999-2003

- Publications

y e a r	b o o k (e d)	I n t . J o u r n a l	B o o k c h a p t e r	I n t . C o n f	o t h e r s
1999	-	3	3	22	1
2000		4	3	27	-
2001	2	3	2	19	-
2002	-	-	-	15	1
2003	1	-	3	27	3



Conferences (1999-2003)

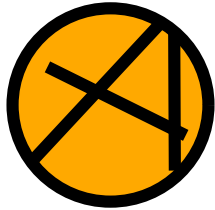
■ Organization

- Advanced Artificial Intelligence School EAIA'00.
- EPIA'03, 11th Portuguese Conference on Artificial Intelligence, Beja, 2003
- Workshop "Natural Language and Information Retrieval" in EPIA'03
- Logics for AI and Information Systems -- A Thematic workshop of EPIA'01. Univ. Porto, December 2001.
- AGP01, APPIA/GULP/PRODE Joint Conference on Declarative Programming, Évora, Portugal, September 2001. Universidade de Évora.
- IV Encontro para o processamento Computacional da Língua Portuguesa Escrita e Falada. Universidade de Évora, 1999.
- II Conferência de redes de Computadores, Évora, 1999



Plans

- Further development of a Contextual Constraint Logic Programming language and its tools (CCxLP & GNU Prolog/CX)
- Integration of temporal logic features: the ISTO language
- Development of Logic Programming Tools for the Semantic Web
- Cooperative Dialogue Systems for flexible query answer
- Knowledge extraction from Juridical database documents using natural language processing techniques
- Agent-based architecture for intelligent web information retrieval systems



Applications

- Logic Programming Tools for the Semantic Web
 - During the last two years we focused on the Semantic Web and developed the W4 tools for supporting reasoning activities in the Semantic Web under the RuleML initiative:
 - A full non-validating conformant XML Parser
 - An IRI parser and resolver of relative IRI references
 - A RuleML parser and engine based on our Paraconsistent Well-founded Semantics with Explicit Negation
 - An RDF reader (NTriples and XML) and complete RDF engine
 - Integration of RDF with RuleML rule bases
 - Support for evolution of RuleBases via EVOLP semantics
 - This has been a very time-consuming activity but is capturing the attention of the research community. A direct outcome is the participation of CENTRIA in the REVERSE NoE.



Applications

- Lexical Ontologies for legal Information
Sharing: LOIS
- Project approved (starts in February, 2004) in the eContent EU program

The focus of the project is the localization of WordNets specialized for the legal domain into 6 European languages, namely Italian, English, German, Czech, Portuguese, and Dutch. The concepts will be linked in order to guarantee cross lingual access to European legislation and other legal documents (such as court cases).

- ITTIG - Istituto di teoria e tecniche dell'informazione giuridica, Italy
- CELI - CELI s.r.l. - Italy
- UEVORA - Évora University/CENTRIA, Portugal
- ULEIDEN - University of Leiden, Netherlands.
- ISLPRAGUE - Institute of State and Law of the Academy of Sciences of the Czech Republic
- UNI-WEIN - Institute of Public International Law, Univ. of Vienna, Austria
- GONET - GoNetwork s.r.l, Italy.
- UNI-SHEFFIELD - University of Sheffield, UK.
- CESI - CESI Multimedia s.r.l., Italy.
- ELLIS - ELLIS Publications, Netherlands.



Applications

- Cooperative dialogue systems
 - Pro-active behaviour
 - Automatic clustering and classification of documents
 - Graphical visualization of document relations
 - Context of interaction
 - User modelling
 - Prototypes
 - PGR (Portuguese Attorney General) web system
 - Supreme Court
 - University Information Systems



Applications

- Knowledge extraction from documents
 - Semantic/pragmatic representation in OWL
 - Syntax (E. Bick)
 - Semantics (Kamp et al.)
 - OWL \leftrightarrow ISCO translation
 - Queries:
 - Natural language \rightarrow ISCO



Applications

- Agent-based architecture for web information retrieval systems
 - FIPA standards – JADE framework
 - Rational, cooperative, autonomous logic programming based agents
 - ISCO
 - EVOLP
 - Semantic information retrieval \leftrightarrow OWL
 - Applications
 - Development of intelligent agent-based systems for web information retrieval
 - PGR web IR system



Applications

- **SIIUE**

- General-purpose academic IS
- Incrementally specified and implemented, since 1998

- **SIIUE.sac**

- Academic services system
 - Software engineering challenge
 - From problem analysis to production in 6 months
- Based on ISCO version 2

- **Dialogue System natural language query of SIIUE**

- Using VISL parser (E. Bick)
- Using the UEvora ISCO database schema to obtain the knowledge base for semantic/pragmatic interpretation.
- Using ISCO V2 to query the UE database contents.



Self assessment

■ Pros

- Applicational Development crossing several research topics
- Some cooperation with national and international teams
- Semantic Web opportunity via REWERSE and other projects

■ To improve

- Journal publication
- Cooperation with international institutions
- Inter-connection of subarea know-how and activities

■ Proposed measures

- Invite international researchers for one or two months periods
- Extend current bilateral cooperations
- Liasion with MSc and PhD programs