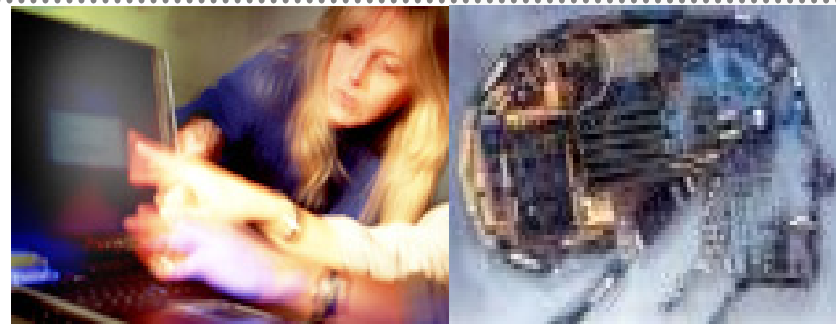




CENTRIA

Centro de Inteligência Artificial, UNL

Centre for Artificial Intelligence, UNL





CENTRIA

# Centre for Artificial Intelligence, UNL

Ministry of Science grade, thrice: 'Very Good'

hosted at

Departamento de Informática - DI

Faculdade de Ciências e Tecnologia - FCT

Universidade Nova de Lisboa – UNL

<http://centria.fct.unl.pt/>



CENTRIA

# Objectives and Structure

- **To promote research in AI and applications**
  - Launch research projects
  - Stimulate national and international cooperation
  - Organize scientific events
  - Foster graduate and post-graduate activities
- **Structured into three main AI research areas**
  - Knowledge Representation and Reasoning  
& Logic Programming - **KRRLP**
  - Intelligent Information Systems - **IIS**
  - Soft Computing and Constraints - **SCC**



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# CENTRIA – People and Funds

- **39 researchers in Dec 2004**
  - 23 PhD holders
  - 16 PhD and MSc students
- **Direct funding from Ministry of Science**
  - Present base funding per year: € 55.5 K
  - Programatic funds per year [1999-2002]: € 31.9 K
  - Programatic funds per year [2003-2006]: € 41.7 K
- **Yearly funding from own projects**
  - Average [1999-2001]: € 148.5 K
  - Average [2002-2003]: € 153.3 K
- **Total yearly funding (outside salaries) € 250 K**



CENTRIA

# Boards

- **Board of directors:**

- **Professor Luís Moniz Pereira** - Director
- **Professor Pedro Barahona**
- **Professor José Júlio Alferes**
- **Professor Irene Pimenta Rodrigues**

- **Advisory board:**

- **Professor Ryszard Michalschi**  
George Mason University, Fairfax VA, USA
- **Professor Fernando Pereira**  
University of Pennsylvania, Philadelphia PA, USA
- **Professor David S. Warren**  
State University of New York at Stony Brook, NY, USA
- **Professor Jörg Siekmann**  
DFKI, Saarbrücken, Germany



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# KRRLP - Knowledge Representation and Reasoning & Logic Programming

- **Foundations of rational computational logic agents, logic programs, knowledge base updates, and implementation**
  - Knowledge Base Updates and Evolution
  - General framework for integrating several reasoning forms (fuzzy, possibilistic, probabilistic, and non-monotonic)
  - Distributed tabling and revision systems
  - Computational models and their implementation for a parallel and distributed logic programming language
- **These topics have strong relations amongst themselves**
  - Implementations are guided by the foundational results and their use in applications
  - They also relate to work in other areas of CENTRIA, such as those of Semantic Engines for the Web and of Intelligent Information Systems



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# SCC - Soft Computing and Constraints (1)

- **Fundamental and applied research in Constraint Programming**
  - Integration of local search and constraint propagation
  - Interaction of constraint propagation techniques with computational geometry methods
  - Set constraints, global, spatial, continuous domains, over-constrained, and fuzzy constraints solvers
  - Architectures for distributed constraint solvers
  - Extend research on multi-valued logics for digital circuits to applications in logic-based agents.
  - Modeling biophysical systems with non-linear constraints over continuous domains



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## SCC - Soft Computing and Constraints (2)

- **Fundamental and applied research in Machine Learning**
  - Machine Learning, Concept Learning
  - Data and Text Mining
  - Fuzzy clustering
  - Self-organizing maps
  - Inductive logic programming
  - Coupling neural networks with genetic algorithms
- **Applications**
  - Medicine and Bioinformatics
  - Interpretation of oceanographic data
  - Intelligent access to music data warehouses
  - General search of texts and data mining in web pages



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# ISS - Intelligent Information Systems (1)

- **Semantic web tools**

- KRR for the Semantic Web - NoE REVERSE

“Reasoning in the Semantic Web”.

- Semantic web based integration of heterogeneous databases.
- Agents for classification of documents and definition of web ontologies.
- Text mining included in Soft Computing and Constraints



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## ISS - Intelligent Information Systems (2)

- **Other ISS tools**

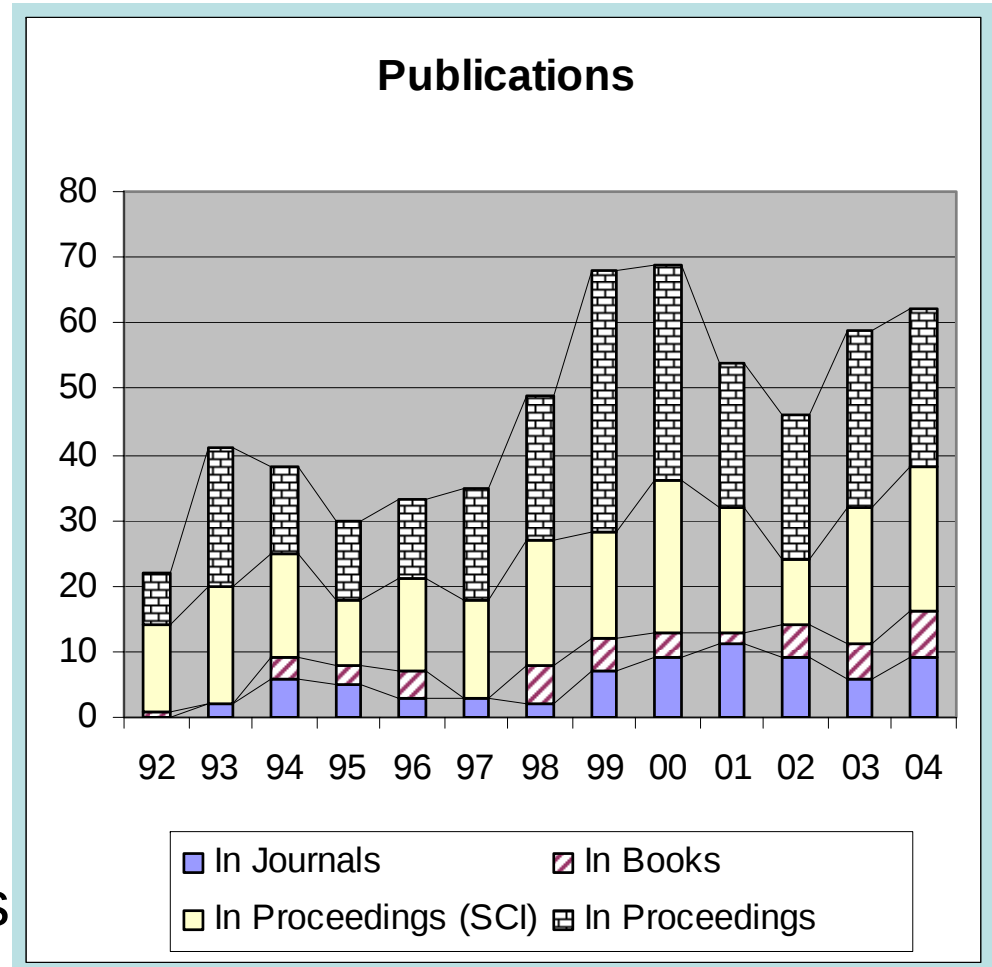
- Meeting and class scheduling; ERP for higher education institutions; natural language querying; integration into UML framework and use of UML editors.
- Retrieving and processing Portuguese documents; specialized tools for cooperative multimodal information-retrieval system.
- Building Natural Language dialogue knowledge bases for the sentence interpretation from Information System description and Semantic Web ontology.
- Designing data warehouses and querying, with computer assisted multidimensional modeling and their physical design; XML web services for scheduling problems; single view maintenance of ORDB.



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# Quality Indicators

- Publications
- International Collaboration
- Projects
- Organization of Scientific Events
- PhD and MSc Theses

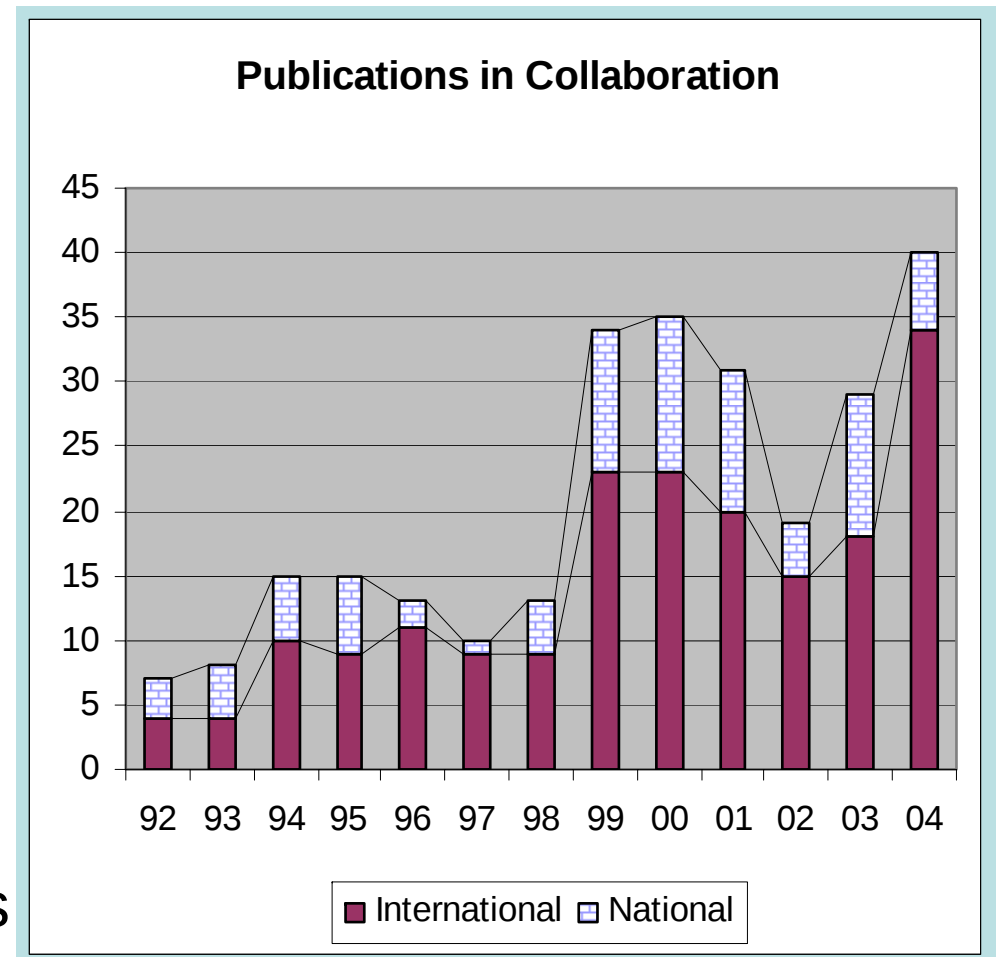




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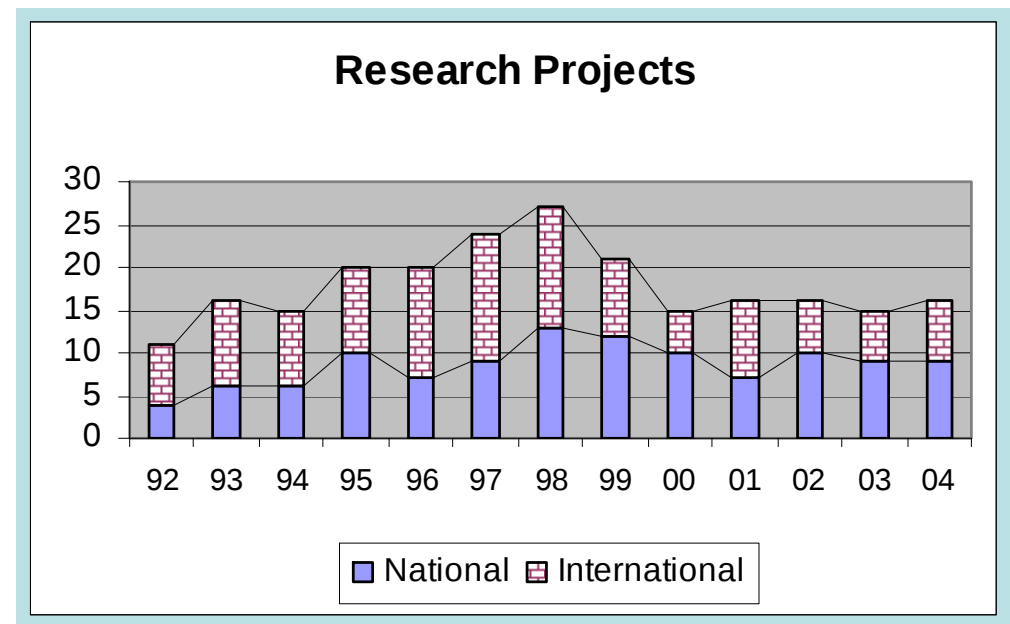




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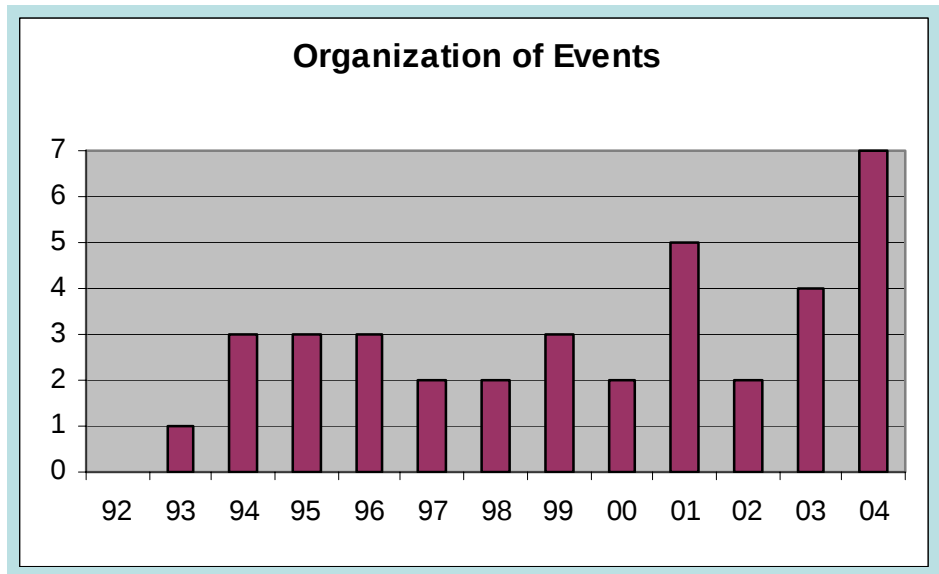




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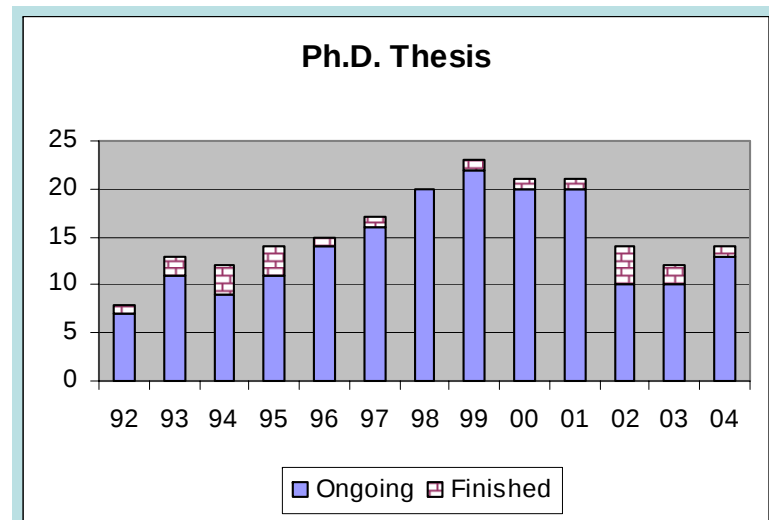
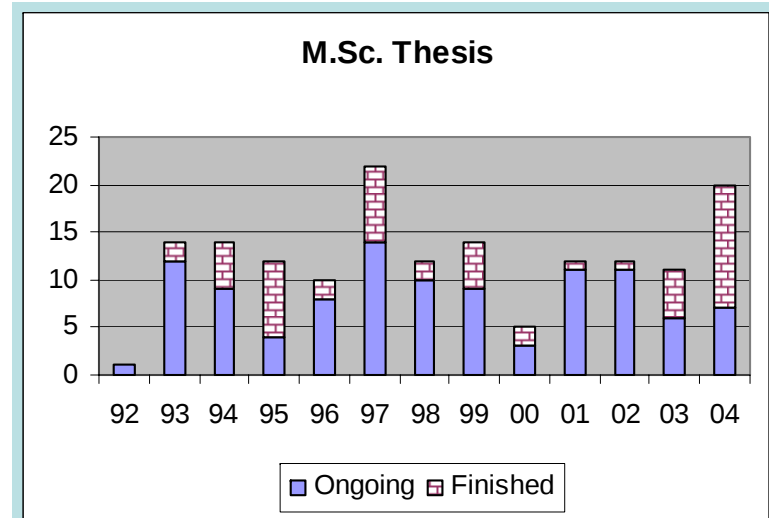




CENTRIA

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# Industrial Relations

- Heurística
- Declarativa
- Portuguese Attorney General
- ParaRede
- Software AG
- Portuguese Parliament
- Marktest
- Environment Institute

- 
- Systran, EU
  - XSB Inc, USA
  - European consortia, EU



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More on CENTRIA

More info ...

<http://centria.fct.unl.pt>

where annual reports can be found



CENTRIA

In the wings

Associate Lab proposal

“COGNOMA”

“COGNição no hOmem e na MAquina”