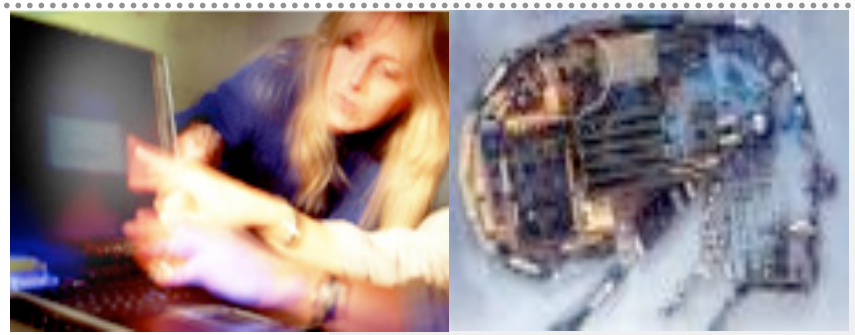
CENTRIA

Centro de Inteligência Artificial, UNL

Centre for Artificial Intelligence, UNL



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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

- **61 researchers in December 2005**
  - 24 PhD holders
  - 12 PhD students and 25 MSc students
- **Direct funding from Ministry of Science**
  - 2005 base funding: € 77.0 K
  - 2005 programatic funding: € 36.7 K
- **2005 funding from own projects** € 228.0 K
- **Total 2005 yearly funding**
  salaries and scholarships excluded **€ 341.7 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 REWERSE

    "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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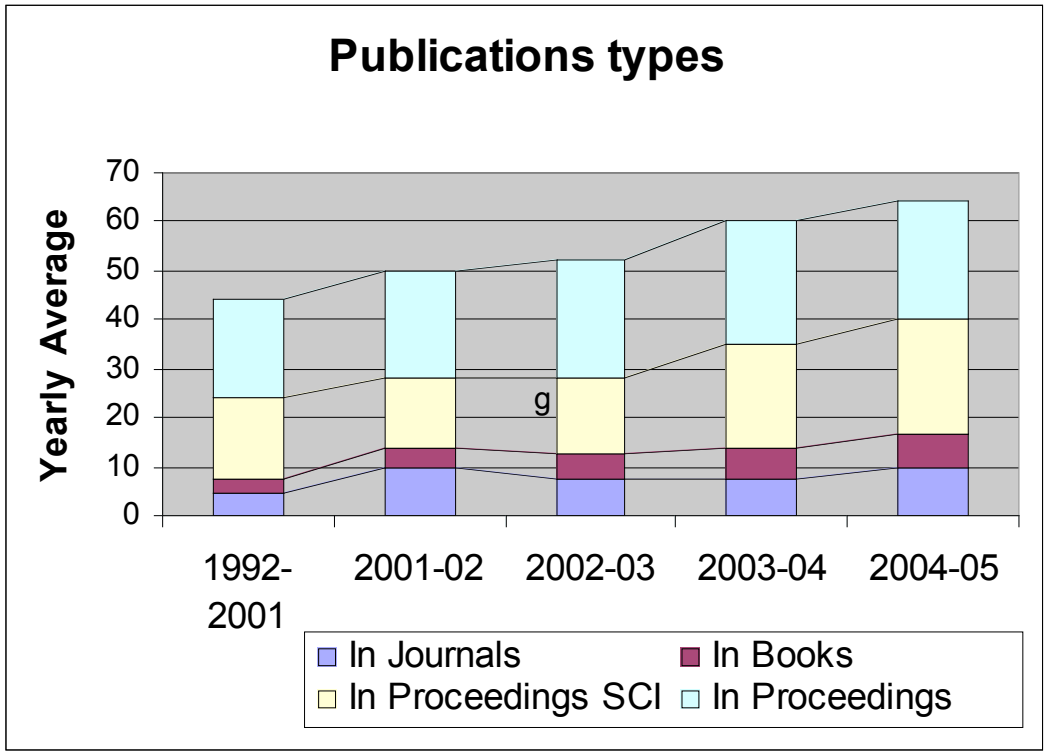
Quality Indicators

- **Publication types**
- Publications with outside collaboration
- Projects
- Organization of scientific events
- PhD and MSc theses



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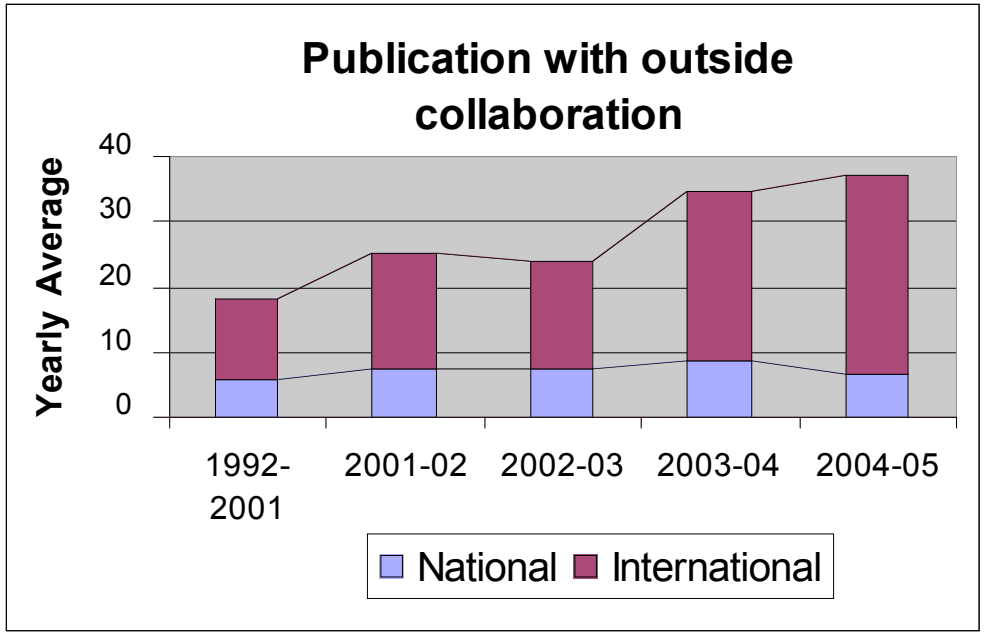

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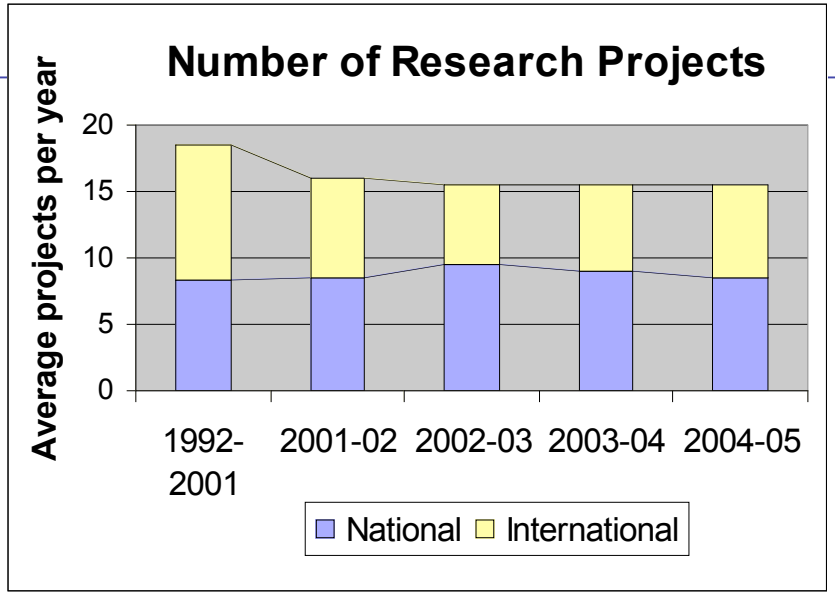

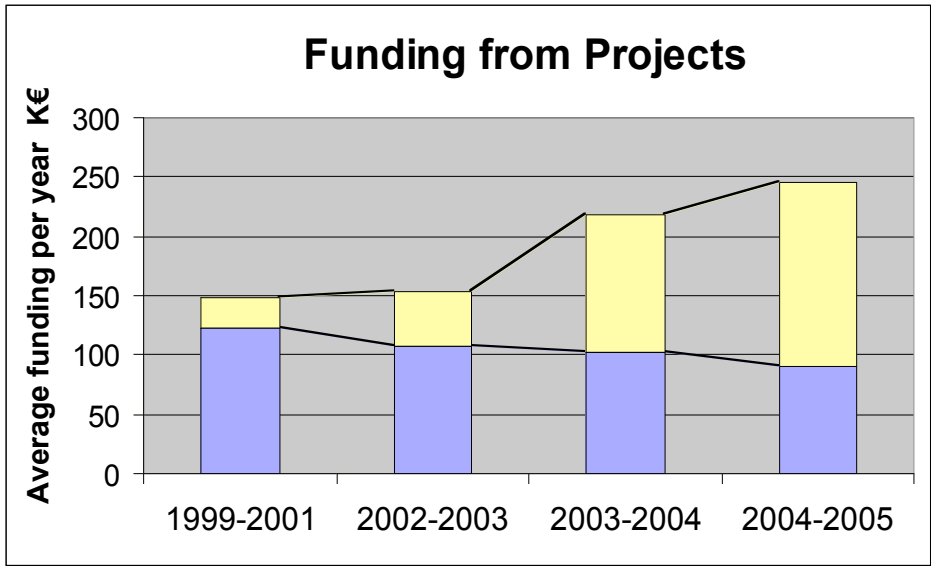

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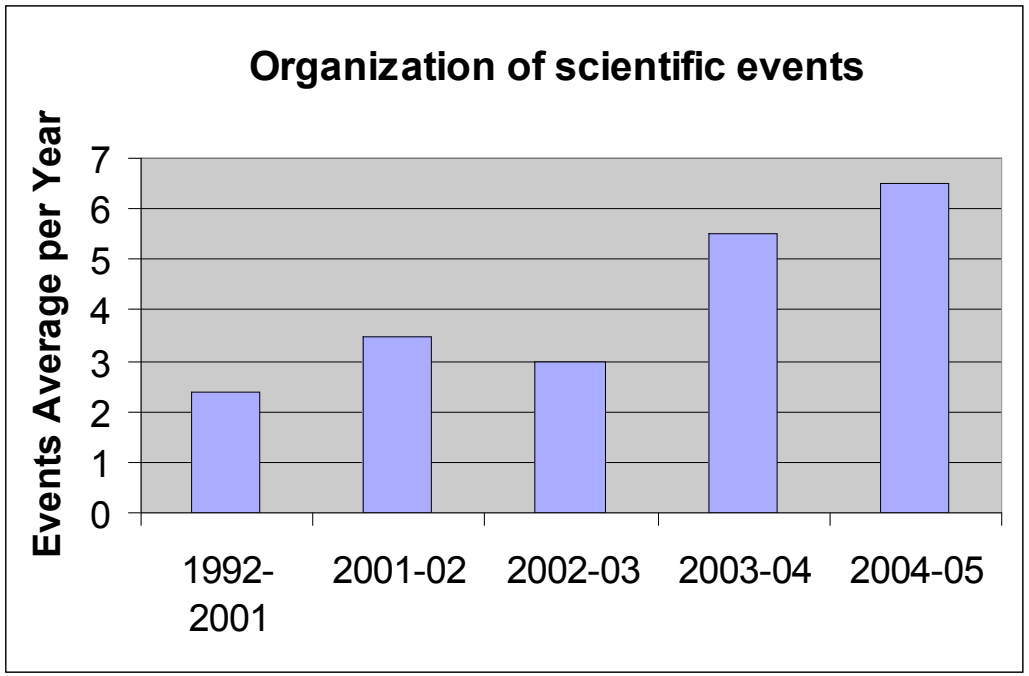

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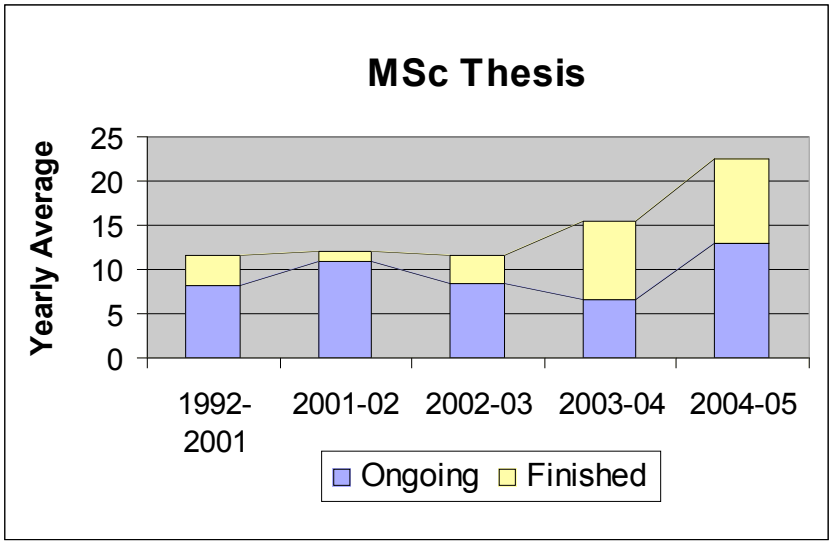

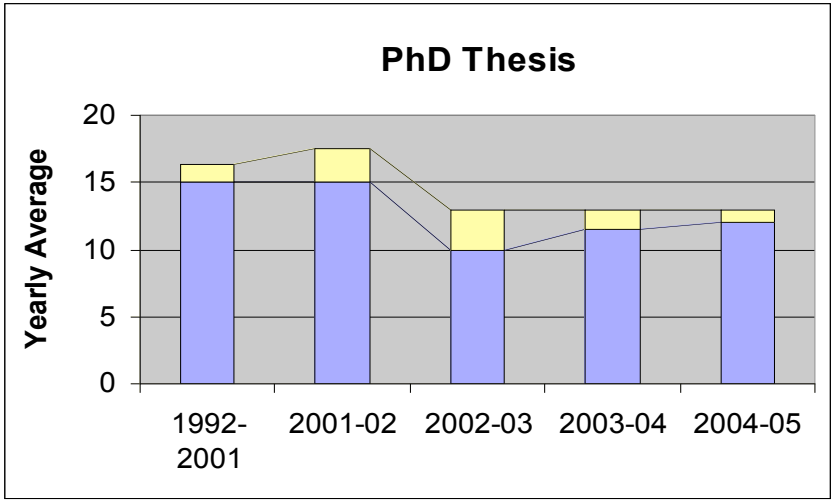

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Industrial Relations

- 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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Select Publications

- J. Alcântara, C.V. Damásio, L.M. Pereira
  An encompassing framework for Paraconsistent Logic Programs
  Journal of Applied Logic, 3(1): 67-95, 2005

- J.J. Alferes, L.M. Pereira,T. Swift
  Abduction in Well-Founded Semantics and Generalized Stable Models via Tabled Dual Programs
  Theory and Practice of Logic Programming, 4(4): 383-428, 2004

- J.J. Alferes, J.A. Leite, L.M. Pereira, H. Przymusinska,T.C. Przymusinski
  Dynamic Updates of Non-Monotonic Knowledge Bases
  The Journal of Logic Programming, 45:(1-3): 43-70, 2000

- J. J. Alferes, L. M. Pereira, H. Przymusinska, T. C. Przymusinski
  LUPS - A language for updating logic programs
  Artificial Intelligence, 138(1-2), 2002

- P. Amaral and P. Barahona
  A Framework for Optimal Correction of Inconsistent Linear Systems
  Constraints, 10(1): 67-86. 2005

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Select Publications

- J. Cruz, P. Barahona
  Constraint Reasoning in Deep Biomedical Models.
  Journal of Artificial Intelligence in Medicine, 34:77-88, 2005

- P. Dell'Acqua, L.M. Pereira
  Common-sense reasoning as proto-scientific agent activity
  Journal Applied Logic, 2(4): 385-407, 2004

- R. Kahle
  A proof-theoretic view of necessity
  Synthese, 148(27): 659-673, 2006

- E. Lamma, L.M.Pereira, F. Riguzzi
  Belief Revision via Lamarckian Evolution
  New Generation Computing, 21(3): 247-275, 2003

- E. Lamma, F. Riguzzi, L.M. Pereira
  Strategies in Combined Learning via Logic Programs
  Machine Learning, 38(1/2): 63-87, 2000

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Select Publications

- S. Nascimento, B. Mirkin, F.M. Pires
  Modeling Proportional Membership in Fuzzy Clustering
  IEEE Transactions on Fuzzy Systems- Fuzzy Systems in Knowledge Discovery and Data Mining, 2(11):173-186, 2003

- J. Saias, P. Quaresma
  A methodology to create legal ontologies in a logic programming based web information retrieval system
  Journal of Artificial Intelligence and Law (AI&Law), 12(4):397–417, 2004

- G. Wheeler
  Rational Acceptance and Conjunctive/Disjunctive Absorption
  Journal of Logic, Language, and Information, Vol 1-2, 2006

- A. Vitória, C.V. Damásio, J. Maluszynski
  From rough sets to rough knowledge bases
  Fundamenta Informaticae, 57(2-4), IOS Press, 2004

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In the wings

Associate Lab submitted proposal

“COGNOMA”

“COGNição no hOmem e na MAquina”

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More on CENTRIA

More info ...

http://centria.fct.unl.pt

where annual reports can be found