

# Curriculum vitae of Alessandro Dal Palù

## Addresses:

Dipartimento di Matematica, Università di Parma,  
Parco Area delle Scienze 53/A, 43100 Parma  
Tel.: (+39) 0521 906962  
Fax: (+39) 0521 906950  
E-mail: [alessandro.dalpalu@unipr.it](mailto:alessandro.dalpalu@unipr.it)  
Web: <http://www.unipr.it/~dalpalu>

**Date of Birth:** 24 January 1979.

**Place of Birth:** Verona (VR).

**Degrees:** Computer Science degree (Laurea = BS + MS), University of Verona, Italy, on 10th Jul 2001.

**Ph.D.:** Ph.D. in Computer Science, at University of Udine on 31th March 2006.

**Current position :** researcher (assistant professor) at Parma University, Dept. of Mathematics.

**Research Interests:** • Programming methodologies with constraint to solve complex problems.

- Tertiary structure prediction for proteins (*Protein Folding Problem*).
- Reconstruction of protein tertiary structure from low resolution density maps experiments.
- Constraint Logic Programming, finite domains, sets. Answer set programming.
- Lower bound analysis of computational complexity and data structure optimization.
- Analysis of multi-dimensional medical images.

## Curriculum Vitae et Studiorum

**Jul 1997** I pursued High School Degree at Liceo Scientifico Statale G.Fracastoro in Verona with 60/60.

**Sep 1997** I enrolled at University of Verona, for a Computer Science degree.

**Sep 1997 – Jul 2002** Scholarship from the Municipality of Verona during my 5 years of University studies.

**Aug 2000** Scholarship from Esu Verona, for a month of intensive English course at Hull University, UK.

**Aug 2001 – Dec 2001** I begun a MS in Computer Science at New Mexico State University, Las Cruces, NM, Usa and collaborated for research on algorithms and data structures optimizations.

**May and Jun 2002** Collaboration with Verona University for a project of remote robotic surgery.

**10th Jul 2002** I received my Computer Science degree from the Faculty of Scienze Matematiche Fisiche e Naturali, University of Verona, thesis title: *New optimal algorithms on pointer machines*, relators: Prof. Roberto Giacobazzi, Prof. Agostino Dovier, Prof. Enrico Pontelli e Prof. Desh Ranjan. I received the mark 110/110 cum laude and a special mention from the committee for my outstanding curriculum.

**Sep – Nov 2002** Research period at University of Parma, for integrating Constraint Logic Programming solvers over sets.

**Jul – Nov 2002** Collaboration with University of Verona for a project to study the disposition of alarms to alert population in case of high tide in the town of Venice.

**Nov 2002** I enrolled and received a scholarship for a Computer Science Ph.D. at University of Udine.

**Apr 2003 – Sep 2004** I was granted a scholarship from the European Social Fund: Misura D4 Miglioramento delle risorse umane nel settore della ricerca e sviluppo tecnologico.

**Feb – Mar 2004** Research period in Jena, Germany, on bioinformatics and Constraint Logic Programming. During this period, I designed and implemented a new protein simulator in the framework of CLP over Finite Domains.

**Aug – Dec 2004** Research at New Mexico State University, Las Cruces, NM, Usa, focusing on bioinformatics, parallelism and Constraint Logic Programming, e.g. I applied parallel constraint programming to solve protein structure prediction problems.

**Oct 2005** End of scholarship for Ph.D. studies (3 years).

**16th Dec 2005** Start researcher position at University of Parma, Dept. of Mathematics.

**31th March 2006** Final dissertation for Ph.D.

**Awards:**

- 9th March 2007: Marco Cadoli Award given by GULP (Gruppo Ricercatori e Utenti Logic Programming) for best Ph.D. thesis on computational logics

**Editor:**

- Book chapter. Constraint Based Methods for Bioinformatics in Trends in Constraint Programming, Frederic Benhamou, Narendra Jussien and Barry O’Sullivan eds. (co-editor). ISBN: 9781905209972, 2007
- Constraints Journal, Special Issue on Constraint based methods for Bioinformatics (co-editor) Volume 13, Issue 1 (2008).

**Program committee:**

- Workshop WCB 05, associated to ICLP 05, Workshop on Constraint Based Methods for Bioinformatics.
- Co-chair Workshop WCB 06, associated to CP 06, Workshop on Constraint Based Methods for Bioinformatics.
- Co-chair Workshop WCB 07, associated to ICLP 07, Workshop on Constraint Based Methods for Bioinformatics.
- Workshop WCB 08, Workshop on Constraint Based Methods for Bioinformatics, associated to CPAIOR 2008.
- PC member and publicity chair of ICLP 08.

**Refereed for:**

- ICLP 03.
- INTERACT 05: 10thIFIP International Conference on Human-Computer Interaction.
- Workshop WCB 05, associated to ICLP 05, Workshop on Constraint Based Methods for Bioinformatics.
- RECOMB 06.
- ICLP 06.
- Workshop WCB 06, associated to CP 06, Workshop on Constraint Based Methods for Bioinformatics.
- FLAIRS 07
- FLOPS 08.
- VMCAI 08.

**Project member:**

- GNCS 2005 Sviluppo di risolutori di vincoli e loro applicazioni in teoria dei codici e bioinformatica
- FIRB 2003: Il riconoscimento molecolare nelle interazioni proteina-ligando, proteina-proteina e proteina superficie: sviluppo di approcci sperimentali e computazionali integrati per lo studio di sistemi di interesse farmaceutico (Approved March 31st 2005) — RBNE03B8KK
- PRIN 2005 (as Ph.D. student): Vincoli per la programmazione con insiemi, l’analisi di sistemi con automi, il ragionamento su intervalli e la bioinformatica. — 2005015491

**Associations:**

- GNCS Gruppo Nazionale per l'Informatica Matematica.
- GULP Gruppo programmatori e Utenti Logic Programming.
- ALP: Association for Logic Programming.
- AI\*IA Associazione Italiana per l'Intelligenza Artificiale.
- Agentlink

**Teaching:**

- A.Y. 2002/03. T.A. for the class: C/C++ Programming for Mathematics and Computer Science at University of Parma.
- A.Y. 03/04, 04/05, 05/06. T.A. for the class: Operating Systems for Biotechnology at University of Udine.
- A.Y. 05/06, 06/07, 07/08. Computer Science at Biotechnology, University of Parma.
- A.Y. 05/06, 06/07, 07/08. Operating Systems, CS degree, University of Parma.

**Invited Seminars:**

- An Optimal Data Structure to Handle Dynamic Environments in Non-deterministic Computations (27/11/02, Università di Parma).
- Protein Folding Complexity (05/05/03, Università di Udine).
- Protein Folding in Constraint Logic Programming over Finite Domains (27/05/04, Lipari Summer School).
- Protein Folding with CLP (13/09/04, New Mexico State University, NM, USA).
- A Constraint Logic Programming Approach to 3D Structure Determination of Large Protein Complexes (16/09/05, Dobbiaco Summer School).

**Conferences/schools:**

- BIBM - IEEE Intl Conference on Bioinformatics and Biomedicine. San Jose CA, 2nd-4th Nov 07.
- From Structural Genomics to Drug Discovery Modeling the Flexibility. Parma 20-21 Sept 07
- ICLP 2007, International Conference on Logic Programming, Porto, Portugal, 6-13 Sep 2007.
- Bioinformatics Group Freiburg - Winter-Seminar January 2007, Freiburg Germany.
- BCI 2006 Summer School. Third International School on Biology, Computation and Information. Dobbiaco, Italy, 11th - 15th Sept 2006.
- 2nd International Workshop on Constraint Based Methods for Bioinformatics (WCB) 2006, Nantes, France, Sept 2006.
- SAC 2006, Symposium on Applied Computing Dijon, France, April 23 -27, 2006.
- LPAR 2005, International Conference on Logic for Programming Artificial Intelligence and Reasoning, Montego Bay, Jamaica, Dicembre 2005.
- ICLP 2005, International Conference on Logic Programming, Sitges, Spagna, 1-6 Ottobre, 2005.
- BCI 2005 Summer School. Second International School on Biology, Computation and Information. Dobbiaco, Italy, 11th - 16th Sept 2005.
- PPDP 2005, Principles and Practice of Declarative Programming, Lisbona, Portogallo, 11-13 Luglio 2005.
- ANALISI SPERIMENTALE E BENCHMARK DI ALGORITMI PER L'INTELLIGENZA ARTIFICIALE del gruppo RCRA dell'AI\*IA, Ferrara, Italy, 10 June 2005.
- CILC 2005, Convegno Italiano di Logica Computazionale, 21 e 22/06/05, Parma.

- ISPA 2004, International Symposium on Parallel and Distributed Processing and Applications, Hong Kong, China, 13-15th December 2004.
- Advanced BioMedicine and BioInformatics Summer School 2004. Molecular and Computational Analysis of Human Phenotype. Lipari, Italy. May 29 - June 5, 2004
- CILC 2004, Convegno Italiano di Logica Computazionale, 15 e 16/06/04, Parma.
- 15ma edizione della Lipari Summer School 2003. Algorithmics for Data Mining and Pattern Discovery. Lipari, Italy, July 13 - July 26 2003.
- ERCIM 2003, Joint Annual Workshop of the ERCIM Working Group on Constraints and the CoLogNET area on Constraint and Logic Programming .Budapest, Hungary, dal 30/06/03 al 02/07/03.
- SWAT 2002, Scandinavian Workshop on Algorithm Theory, Turku Finland, dal 03/07/02 al 05/07/02,
- IFIP World Computer Congress 17<sup>th</sup> edition, Montreal 2002, dal 25/08/02 al 30/08/02.

# Scientific Publications - Pubblicazioni scientifiche

## International Journals - Riviste Internazionali

1. A. Dal Palù, J. He, E. Pontelli, Y. Lu. A Constraint Logic Programming approach to associate 1D and 3D structural components for large protein complexes. In *International Journal of Data Mining and Bioinformatics*, 1(4), 352-371, 2007.
2. A. Dal Palù, A. Dovier and E. Pontelli. A constraint solver for discrete lattices, its parallelization, and application to protein structure prediction. In *Software: Practice and Experience* DOI 10.1002/spe.810 2007 Volume 37, Issue 13 , Pages 1405 - 1449. Accepted: 23 December 2006.
3. A. Dal Palù, E. Pontelli and D. Ranjan Sequential And Parallel Algorithms For The Nca Problem On Pure Pointer Machines. In *Theoretical Computer Science*, 1–3(352):108–135, March 2006, ISSN: 0304-3975.
4. A. Dal Palù, A. Dovier and F. Fogolari. Constraint Logic Programming approach to protein structure prediction. *BMC Bioinformatics* 5(186), November 2004. (Impact factor 5.42)
5. F. Avanzini, D. Rocchesso, A. Belussi, A. Dal Palù, and A. Dovier. A urban-scale auditory warning system for high tides in Venice. *IEEE Computers* 37(9):55–61, September 2004.
6. D. Ranjan, E. Pontelli, A. Dal Palù. An Optimal Data Structure to Handle Dynamic Environment in Non-deterministic Computations. In *Computer Languages*, 28(2):181–201, Pergamon Press 2002.

## National Journals - Riviste Nazionali

7. L. Bortolussi, A. Dal Palù, A. Dovier, and F. Fogolari. Simulazione del processo di ripiegamento di una proteina utilizzando un sistema ad agenti Agent-based Protein Folding Simulation. In *Intelligenza Artificiale*, 1:56-61, 2005, ISSN 1724-8035.

## Book Chapters - Capitoli di libri

8. A. Dal Palù, A. Dovier, S. Will. Introduction to the Special Issue. *Constraints*, 13(1):1-2, 2008.
9. A. Dal Palù, A. Dovier, F. Fages, S. Will. Constraint Based Methods for Bioinformatics. In *Trends in Constraint Programming*. Frederic Benhamou, Narendra Jussien and Barry O’Sullivan eds. ISBN: 9781905209972, 2007

## International Conferences - Convegni internazionali

10. A. Dal Palù, A. Dovier, E. Pontelli. Enhancing the Computation of Approximate Solutions of the Protein Structure Determination Problem Through Global Constraints for Discrete Crystal Lattices. In *In proceedings of Computational Structural Bioinformatics Workshop (BIBM 07) November 4, 2007, San Jose, CA.*
11. A. Dal Palù, E. Pontelli, D. Ranjan. An Optimal Algorithm for Finding NCA on Pure Pointer Machines. In *Algorithm Theory - SWAT 2002*, Lecture Notes In Computer Science, 428–438, Springer-Verlag 2002 ISBN: 3-540-43866-1.
12. A. Dal Palù, E. Pontelli, D. Ranjan. An Efficient Parallel Pointer Machine Algorithm for Nearest-Common Ancestor Problem. In *IFIP International Conference on Theoretical Computer Science*, Information Processing Letters, 85(5):275–283, Elsevier North-Holland 2003, ISSN: 0020-0190.
13. F. Avanzini, D. Rocchesso, A. Belussi, A. Dal Palù, and A. Dovier. Acqua alta a Venezia: design of a urban scale auditory warning system ICAD 2003, Proc. Int. Conf. on Auditory Display, ICAD 2003, pp. 184–187, Boston, 2003.
14. A. Dal Palù, A. Dovier, F. Fogolari. Protein Folding in CLP(FD) with Empirical Contact Energies. In *Joint Annual Workshop of the ERCIM Working Group on Constraints and the CoLogNET area on Constraint and Logic Programming*, MTA SZTAKI, Budapest, Hungary 30 June - 2 July, 2003. In K.R. Apt, F. Fages, F. Rossi, P. Szeredi and J. Vancza, eds, *Recent Advances in Constraints*, 2003, LNAI 3010, May 2004.
15. A. Dal Palù, A. Dovier, E. Pontelli and G. Rossi Integrating Finite Domain Constraints and CLP with Sets. In D. Miller, ed., *Proc. of Fifth ACM-SIGPLAN International Conference on Principles and Practice of Declarative Programming* Uppsala, Sweden, pp. 219–229, 27-29 August 2003.

16. L. Bortolussi, A. Dal Palù, A. Dovier, and F. Fogolari. Protein Folding Simulation in CCP. BioConcur 2004, Workshop on Concurrent Models in Molecular Biology, London, 30 August 2004.
17. A. Dal Palù, A. Dovier and E. Pontelli. Heuristics, Optimizations, and Parallelism for Protein Structure Prediction in CLP(FD). In proceedings of PPDP 2005, Lisboa, 11–13 July 2005.
18. A. Dal Palù, A. Dovier and E. Pontelli. A New Constraint Solver for 3-D Lattices and its Application to the Protein Folding Problem. In G. Sutcliffe, A. Voronkov eds., Proc. of Logic for Programming, Artificial Intelligence, and Reasoning. LNAI 3835, ISSN 0302-9743, December 2005, Montego Bay, Jamaica.
19. A. Dal Palù, Enrico Pontelli, Jing He, Yonggang Lu. A Constraint Logic Programming Approach to 3D Structure Determination of Large Protein Complexes. In proceedings of Symposium on Applied Computing (SAC) 2006, April 23-27 Dijon, France.
20. A. Dal Palù, J. He, E. Pontelli, Y. Lu. Identification of alpha-Helices from Low Resolution Protein Density Maps. In proceedings of Computational Systems Bioinformatics Conference (CSB) 2006, August 14-18, Stanford CA.

### Conferences with non official proceedings - Convegni con atti non ufficiali

21. F. Avanzini, A. Belussi, A. Dal Palù, A. Dovier, and D. Rocchesso. Optimal Placement of Acoustic Sources in a Built-up Area using *CLP(FD)* In J. J. Moreno-Navarro and J. M. Carballo eds., APPIA-GULP-PRODE 2002, Joint Conference on Declarative Programming, Madrid, Spain, 16–18 September 2002, pp. 139–154.
22. A. Dal Palù, S. Will, R. Backofen, and A. Dovier. Constraint Based Protein Structure Prediction Exploiting Secondary Structure Information. In G. Rossi, E. Panegai (eds.), Proc. of CILC'04, *Italian Conference on Computational Logic* 16-17 giugno 2004, Parma, Research Report Quaderno del Dipartimento di Matematica, Università di Parma, n. 390, Novembre 2004.
23. L. Bortolussi, A. Dal Palù, and A. Dovier. Constraint-based tools for protein folding. Demo at CILC'04, *Convegno Italiano di Logica Computazionale* 16-17 giugno 2004, Parma.
24. L. Bortolussi, A. Dal Palù, A. Dovier and F. Fogolari. Protein Folding Simulation in CCP. In proceedings of *IX Convegno della Associazione Italiana Intelligenza Artificiale*, 15–17 Settembre 2004, Perugia.
25. A. Dal Palù, A. Dovier and E. Pontelli. Heuristics, Optimizations, and Parallelism for Protein Structure Prediction in CLP(FD). In proceedings of CILC 2005, Rome 21-22 June 2005.

### Workshops

26. A. Dal Palù, A. Dovier, E. Pontelli and G. Rossi. Integrating Finite Domain Constraints and CLP with Sets. In 12th International Workshop on Functional and (constraint) Logic Programming. Valencia, June 2003.
27. A. Dal Palù, A. Dovier, and E. Pontelli. Global Constraints for Discrete Lattices. In 2nd International Workshop on Constraint Based Methods for Bioinformatics (CP2006). Nantes, France, Sept 2006.

### Technical Reports - Rapporti di ricerca

- E. Pontelli, D. Ranjan, and A. Dal Palù: Ancestor Problems on Pure Pointer Machines. NMSU-CS-2001-005, Dept. of Computer Science, New Mexico State University, USA, Nov 2001.
- A. Dal Palù, E. Pontelli, and D. Ranjan: An Optimal Algorithm for Finding NCA on Pure Pointer Machines. NMSU-CS-2001-007, Dept. of Computer Science, New Mexico State University, USA, Nov 2001.
- A. Dal Palù, E. Pontelli, and D. Ranjan: An Efficient Parallel Pointer Machine Algorithm for Nearest-Common Ancestor Problem. NMSU-CS-2001-009, Dept. of Computer Science, New Mexico State University, USA, Nov 2001.
- A. Dal Palù, A. Dovier, E. Pontelli, G. Rossi. A Constraint Logic Programming Framework for Effective Programming with Sets and Finite Domains. Quaderno del Dipartimento di Matematica, n. 437, Università di Parma, March 2006.

## Posters

- A.Dal Palù, A.Dovier and F.Fogolari. Protein Folding in CLP(FD) with Empirical Contact Energies. Poster at European Conference in Computational Biology ECCB'2003, Paris 26–30 Sept.
- A. Dal Palù, A. Dovier, F. Fogolari. Protein Folding Simulation in CCP. Poster in Proc. of International Conference of Logic Programming 2004, LNCS 3132 pp. 452-453, Saint Malo, France.
- L. Bortolussi, A. Dal Palù, A. Dovier. Two constraint-based tools for protein folding. Poster at CILC 2004, Parma, 16-17 giugno 2004.
- A.Dal Palù, A.Dovier, F.Fogolari, R.Backofen, S.Will. Protein Folding with Constraint Logic Programming. Poster at BioInformatics Summer School, Lipari 2004.