Curriculum Vitae

Ugo Dal Lago, PhD
Dipartimento di Informatica – Scienza e Ingegneria
Università degli Studi di Bologna
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Personal Data

Date of birth : 26 February, 1977
Place of birth : Schio, Italy
Nationality : Italian
Current position : Associate Professor, Dipartimento di Scienze dell'Informazione, Università di Bologna

Education

01/2003–12/2005: *Università di Bologna, Italy*. Computer Science PhD Studentship. Advisor: Professor Simone Martini. Research Topic: Linear Logic and Implicit Computational Complexity. Funded by MIUR (Ministero dell'Istruzione, della Ricerca e dell'Università). Defense Date: April 26th, 2006.

10/1996–07/2001: *Università di Udine, Italy*. Computer Science Master. Graduated with full marks (110/110 cum laude).

Employment

Long Term

from 11/2015: *Università di Bologna*. Associate Professor.

01/2007–12/2007: *Université Denis Diderot, Paris, France*. Marie Curie Fellow. Research Topic: Abstract Semantic Frameworks for Implicit Computational Complexity. Funded by European Commission.

10/2006:–10/2015 *Università di Bologna*. Assistant Professor.

09/2001–07/2002: *ITC-IRST, Trento, Italy*. Research Assistant.

Short Term

06/2016 *Université Denis Diderot, Paris, France*. Invited Professor. Research Topic: Probabilistic Programming and Denotational Semantics.

01/2016 *ENS Lyon, France*. Invited Professor. Research Topic: Complexity Analysis by Linear Dependent Types.

03/2011 *University of Kyoto, Japan*. Invited Professor. Research Topic: Intersection Types and Implicit Complexity.

03/2011 *Université Denis Diderot, Paris, France*. Invited Professor. Research Topic: Quantum Computation.

07/2010 *ENS Lyon, France*. Invited Professor. Research Topic: Implicit Computational Complexity.

05/2006–10/2006: *Université de Paris-Nord, France*. Postdoc Grant. Research Topic: Implicit Computational Complexity. Funded by Université Paris-Nord.

01/2006–04/2006: *Università di Verona, Italy*. Postdoc Grant. Research Topic: Implicit Computational Complexity. Funded by MIUR (Ministero dell'Istruzione, della Ricerca e dell'Università).

Awards

05/2015: *Best Italian Young Researcher in Theoretical Computer Science*. Awarded by Italian Chapter of EATCS.

09/2006: *Best Italian PhD Thesis on Theoretical Computer Science*. Awarded by Italian Chapter of EATCS.

07/2006: *Kleene Award for Best LICS Student Paper*. Awarded by IEEE.

Fellowships

05/2006: *"Marie Curie" Fellowship*. Funded by European Union.

02/2006: *Post-doc Fellowship*. Funded by Université Paris Nord.

01/2006: *Post-doc Fellowship*. Funded by MIUR (Ministero dell'Istruzione, della Ricerca e dell'Università).

05/2004: *"Marco Polo" Fellowship*. Funded by Università di Bologna.

Research

Research Interests

- Implicit Computational Complexity and Complexity Analsysis
- Probabilistic Computation and Cryptography.
- Linear Logic.
- Quantum Computation Theory.

Research Projects

2015-2017 CRECOGI ("Concurrent, Resourceful and Effectful COmputation, by Geometry of Interaction"). Équipe Associée INRIA-JAPON. **Responsabile Scientifico** del progetto.

2014-2018 ELICA ("Expanding Logical Ideas in Complexity Analysis"). Research Project. Founded by ANR, France.

2013-2016 PACE ("beyond plain Processes: Analysis techniques, Coinduction and Expressiveness"). Research Project. Founded by ANR, France.

2011-2012 ETERNAL ("intEracTive rEsouRce AnaLysis"). Cooperative Research Project. Founded by INRIA, France. **Scientific coordinator** of the project, involving INRIA-PARSIFAL (local coordinator: Dale Miller) and INRIA-PIR2 (local coordinator: Pierre-Louis Curien).

2009–2012 HATS ("Highly Adaptable and Trustworthy Software using formal methods"). Research Project (Project no. FP7-231620). Funded by European Union under FP7.

2008–2010 CONCERTO ("CONtrol and CERTification of Resources Usage"). Research Project. Partially funded by MIUR (Ministero dell'Istruzione, Università e Ricerca).

2006 NOCOST ("Nouveaux Outils pour la COmplexité : SÃ©mantique et Types"). Funded by ANR (Agence Nationale de la Recherche).

2005–2006 FOLLIA ("FOndazioni LOgiche di LInguaggi Astratti di programmazione") Research Project. Partially funded by MIUR (Ministero dell'Istruzione, Universitá e Ricerca).

2003–2004 PROTOCOLLO ("From PROof TO COmputation through Linear LOgic") Research Project. Partially funded by MIUR (Ministero dell'Istruzione, Università e Ricerca).

2001–2002 FORPICS European Research Project.

Invited Talks

- "Context Equivalences and Metrics in Probabilistic Lambda-Calculi" *Logic and Semantics Seminary, University of Cambridge*, October 2016.
- "Higher-Order Probabilistic Computation: Calculi, Observational Equivalence, and Implicit Complexity" *16th Italian Conference on Theoretical Computer Sceince, Firenze*, September 2015.
- "On Bisimulation Relations for Probabilistic Higher-order Functional Programs". *Workshop on Semantics of proofs and programs, IHP, Paris*, June 2014.
- "The Geometry of Synchronization". *Workshop on Concurrency, Logic, and Types, Lyon*, February 2014.
- "Implicit Computational Complexity in a Concurrency Scenario". 11th International *Workshop on Logic and Computational Complexity (LCC), Edinburgh*, July 10th, 2010.
- Invited Lectures on "Implicit Computational Complexity". European Summer School on Logic, Language and Information. Copenhagen, August 8th to 13th, 2010.
- "On the Linear Logic Approach to Implicit Computational Complexity: Semantics". *LOGIC. Workshop in Honor of Jean-Yves Girard's 60th Birthday*. May 19th 2007.
- "Context Semantics and Implicit Computational Complexity". *Séminaire Logique et Interaction, Institut de Mathématiques de Luminy*. March 27th 2007.
- "An Invariant Cost Model for the Lambda Calculus". *Laboratoire d'Informatique de l'Université Paris-Nord, Paris, France*. Invited by Patrick Baillot. November 28th, 2005.
- "Quantitative Models and Implicit Complexity". *Laboratoire d'Informatique de l'Université Paris-Nord, Paris, France*. Invited by Patrick Baillot. June 15th, 2005.
- "The Geometry of Linear Higher-Order Recursion". *CRISS workshop, Paris, France* June 13th, 2005.
- "Quantitative Models and Implicit Complexity". *National Institute of Informatics, Tokyo, Japan*. Invited by Kazushige Terui. April 14th 2005.
- "The Geometry of Linear Higher-Order Recursion". *Università di Verona, Italy*. Invited by Andrea Masini. March 21st, 2005.

Participation to Steering Committees

- From March 2012, he is a member of the DICE Steering Committee.
- From December 2014, he is a secretary of the IFIP WG 1.6 on Term Rewriting.

Program Committee Chairing

- *Conferences*: FOSSACS2018.
- *Workshop*: DICE2012, FOPARA2013, DCM2014, LCC2016.

Participation to Program Committees

- *Conferences*: LICS2008, ICALP2010, TLCA2011, ICALP2012, FOSSACS2013, CSL2013, FSTTCS2013, RTATLCA2014, IFIP-TCS2014, FOSSACS2015, ICALP 2015, CSL 2015, ICTCS 2015, FSCD 2016, CSL2017, FSCD2017.
- *Workshops*: GALOP2009, LINEARITY2009, FOPARA2009, DICE2010, DICE2011, WST2012, GALOP 2013, LOLA2014, DCM2015, FOPARA2015, CMCS2016, WST2016.

Participation to PhD Thesis Committees

- Member of the PhD Committee for the following PhD Theses:
  - Antoine Madet, Université Denis-Diderot, 2012;
  - Clément Aubert, Université Paris-Nord, 2013;
  - Stephane Zimmermann, Université Denis-Diderot, 2013;
  - Marc Bagnol, Université Aix-Marseille, 2014;
  - Michele Alberti, Université Aix-Marseille, 2014;
  - Erika de Benedetti, Università di Torino, 2015;
  - Matteo Pascucci, Università di Verona, 2016;
  - Thomas Leventis, Université Aix-Marseille, 2016.
- Reviewer of the PhD Thesis of Martin Avanzini, University of Innsbruck, 2013.

Teaching

Courses

- Computer Architectures, *Università di Bologna*.
- Cryptography, *Università di Bologna*.
- Operations Research, *Università di Bologna*.
- Introduction to Java Programming, *Università di Bologna*.
- Introduction to Python Programming, *Università di Bologna*.

Teaching Assistantship

- Mathematical Logic for Computer Science, *University of Bologna*.
- Programming, *University of Padova*.

PhD Thesis Supervision

- Alberto Cappai. *On Equivalences, Metrics, and Computational Indistinguishability*. Dottorato in Informatica, Università di Bologna. Supervisor.
- Alessandro Rioli. *Coinductive Techniques on a Linear Quantum λ-Calculus*. Dottorato in Informatica, Università di Bologna. Supervisor.
- Sara Zuppiroli. *Probabilistic Recursion Theory and Implicit Computational Complexity*. Dottorato in Informatica, Università di Bologna. Supervisor.
- Giulio Pellitta. *Extending Implicit Computational Complexity and Abstract Machines to Languages with Control*. Dottorato in Informatica, Università di Bologna. Co-supervisor.
- Paolo Parisen Toldin. *Implicit Computational Complexity and Probabilistic Classes*. Dottorato in Informatica, Università di Bologna. Co-supervisor.

Selected Papers and Publications

Thesis

[DL06] **Ugo Dal Lago**. *Semantic Frameworks for Implicit Computational Complexity*. Ph.D. thesis, Dipartimento di Informatica, Università degli Studi di Bologna, March 2006. Winner of the 2006 award for the best italian doctoral thesis on theoretical computer science, assigned by the Italian Chapter of EATCS.

Journals

[ADL16] **Beniamino Accattoli** and **Ugo Dal Lago**. (leftmost-outermost) beta reduction is invariant, indeed. *Logical Methods in Computer Science*, 12(1), 2016.

[DLS16] **Ugo Dal Lago** and **Ulrich Schöpp**. Computation by interaction for space-bounded functional programming. *Inf. Comput.*, 248:150–194, 2016.

[BDL16] **Patrick Baillot** and **Ugo Dal Lago**. Higher-order interpretations and program complexity. *Inf. Comput.*, 248:56–81, 2016.

[LG16] **Ugo Dal Lago** and **Paolo Di Giamberardino**. On session types and polynomial time. *Mathematical Structures in Computer Science*, 26(8):1433–1458, 2016.

[DLMS16] **Ugo Dal Lago**, **Simone Martini**, and **Davide Sangiorgi**. Light logics and higher-order processes. *Mathematical Structures in Computer Science*, 26(6):969–992, 2016.

[DLPT15] **Ugo Dal Lago** and **Paolo Parisen Toldin**. A higher-order characterization of probabilistic polynomial time. *Inf. Comput.*, 241:114–141, 2015.

[DLP14] **Ugo Dal Lago** and **Barbara Petit**. Linear dependent types in a call-by-value scenario. *Sci. Comput. Program.*, 84:77–100, 2014.

[DLZ12] **Ugo Dal Lago** and **Margherita Zorzi**. Probabilistic operational semantics for the lambda calculus. *RAIRO - Theor. Inf. and Applic.*, 46(3):413–450, 2012.

[BDLM12] **Patrick Baillot**, **Ugo Dal Lago**, and **Jean-Yves Moyen**. On quasi-interpretations, blind abstractions and implicit complexity. *Mathematical Structures in Computer Science*, 22(4):549–580, 2012.

[DLM12] **Ugo Dal Lago** and **Simone Martini**. On constructor rewrite systems and the lambda calculus. *Logical Methods in Computer Science*, 8(3), 2012.

[DLG12] **Ugo Dal Lago** and **Marco Gaboardi**. Linear dependent types and relative completeness. *Logical Methods in Computer Science*, 8(4), 2012.

[DLH11] **Ugo Dal Lago** and **Martin Hofmann**. Realizability models and implicit complexity. *Theor. Comput. Sci.*, 412(20):2029–2047, 2011.

[BCL11] **Patrick Baillot**, **Paolo Coppola**, and **Ugo Dal Lago**. Light logics and optimal reduction: Completeness and complexity. *Information and Computation*, 209(2):118–142, 2011.

[DLH10a] **Ugo Dal Lago** and **Martin Hofmann**. Bounded linear logic, revisited. *Logical Methods in Computer Science*, 6(4), 2010.

[DLH10b] **Ugo Dal Lago** and **Martin Hofmann**. A semantic proof of polytime soundness for light affine logic. *Theory of Computing Systems*, 46(4):673–689, 2010.

[DLMZ10] **Ugo Dal Lago**, **Andrea Masini**, and **Margherita Zorzi**. Quantum implicit computational complexity. *Theoretical Computer Science*, 411(2):377–409, 2010.

[DLMZ09] **Ugo Dal Lago**, **Andrea Masini**, and **Margherita Zorzi**. On a measurement-free quantum lambda calculus with classical control. *Mathematical Structures in Computer Science*, 19(2):297–335, 2009.

[DL09a] **Ugo Dal Lago**. Context semantics, linear logic and computational complexity. *ACM Transactions on Computational Logic*, 10(4), 2009.

[DL09b] **Ugo Dal Lago**. The geometry of linear higher-order recursion. *ACM Transactions on Computational Logic*, 10(2), 2009.

[DLM08] **Ugo Dal Lago** and **Simone Martini**. The weak lambda-calculus as a reasonable machine. *Theoretical Computer Science*, 398(1-3):32–50, 2008.

[CDLRDR08] **Paolo Coppola**, **Ugo Dal Lago**, and **Simonetta Ronchi Della Rocca**. Light logics and the call-by-value lambda calculus. *Logical Methods in Computer Science*, 4(4), 2008.

[DLMP07] **Ugo Dal Lago**, **Angelo Montanari**, and **Gabriele Puppis**. Compact and tractable automaton-based representations of time granularities. *Theoretical Computer Science*, 373(1-2):115–141, 2007.

[DLB06] **Ugo Dal Lago** and **Patrick Baillot**. Light affine logic, uniform encodings and polynomial time. *Mathematical Structures in Computer Science*, 16(4):713–733, 2006.

[DLM04] **Ugo Dal Lago** and **Simone Martini**. Phase semantics and decidability of elementary affine logic. *Theoretical Computer Science*, 318(3):409–433, 2004.

Conferences and Workshops with Refereed Proceedings

[DLFVY17] **Ugo Dal Lago**, **Claudia Faggian**, **Benoît Valiron**, and **Akira Yoshimizu**. The geometry of parallelism: classical, probabilistic, and quantum effects. In *Fourty-Fourth Symposium on Principles of Programming Languages, Proceedings*, pages 833–845. 2017.

[BDLGS16] **Johannes Borgström**, **Ugo Dal Lago**, **Andrew D. Gordon**, and **Marcin Szymczak**. A lambda-calculus foundation for universal probabilistic programming. In *Twenty-First International Conference on Functional Programming, Proceedings*, pages 33–46. 2016.

[DL16] **Ugo Dal Lago**. Infinitary lambda calculi from a linear perspective. In *Thirty-First Annual Symposium on Logic in Computer Science, Proceedings*, pages 447–456. 2016.

[BBDL15] **Patrick Baillot**, **Gilles Barthe**, and **Ugo Dal Lago**. Implicit computational complexity of subrecursive definitions and applications to cryptographic proofs. In *Twentieth International Conference on Logic for Programming, Artificial Intelligence, and Reasoning, Proceedings*, volume 9450 of *LNCS*, pages 203–218. Springer, 2015.

[ADLM15] **Martin Avanzini**, **Ugo Dal Lago**, and **Georg Moser**. Analysing the complexity of functional programs: higher-order meets first-order. In *Twentieth International Conference on Functional Programming, Proceedings*, pages 152–164. 2015.

[DFDL15] **Yuxin Deng**, **Yuan Feng**, and **Ugo Dal Lago**. On coinduction and quantum lambda calculi. In *Twenty-Sixth International Conference on Concurrency Theory, Proceedings*, volume 42 of *LIPIcs*, pages 427–440. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2015.

[CDL15a] **Alberto Cappai** and **Ugo Dal Lago**. On equivalences, metrics, and polynomial time. In *Twentieth International Symposium on Fundamentals of Computation Theory, Proceedings*, volume 9210 of *LNCS*, pages 311–323. Springer, 2015.

[DLFVY15] **Ugo Dal Lago**, **Claudia Faggian**, **Benoît Valiron**, and **Akira Yoshimizu**. Parallelism and synchronization in an infinitary context. In *Thertieth Annual Symposium on Logic in Computer Science, Proceedings*, pages 559–572. IEEE Computer Society, 2015.

[CDL15b] **Raphaëlle Crubillé** and **Ugo Dal Lago**. Metric reasoning about λ-terms: The affine case. In *Thertieth Annual Symposium on Logic in Computer Science, Proceedings*, pages 633–644. IEEE Computer Society, 2015.

[DLR15] **Ugo Dal Lago** and **Alessandro Rioli**. Applicative bisimulation and quantum λ-calculi. In *Sixth International Conference on Fundamentals of Software Engineering, Proceedings*, volume 9392 of *LNCS*, pages 54–68. Springer, 2015.

[ADL15] **Martin Avanzini** and **Ugo Dal Lago**. On sharing, memoization, and polynomial time. In *Theoretical Aspects of Computer Science, 32nd International Symposium, Proceedings*, volume 30 of *LIPIcs*, pages 62–75. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2015.

[LZ14] **Ugo Dal Lago** and **Sara Zuppiroli**. Probabilistic recursion theory and implicit computational complexity. In *Theoretical Aspects of Computing, 11th International Colloquium, Proceedings*, volume 8687 of *LNCS*, pages 97–114. Springer, 2014.

[ADL14] **Beniamino Accattoli** and **Ugo Dal Lago**. Beta reduction is invariant, indeed. In *Twenty-Third Annual Conference on Computer Science Logic and Twenty-Ninth Annual Symposium on Logic in Computer Science, Proceedings*, page 8. 2014.

[DLFHY14] **Ugo Dal Lago**, **Claudia Faggian**, **Ichiro Hasuo**, and **Akira Yoshimizu**. The geometry of synchronization. In *Twenty-Third Annual Conference on Computer Science Logic and Twenty-Ninth Annual Symposium on Logic in Computer Science, Proceedings*, page 35. 2014.

[DLSA14] **Ugo Dal Lago**, **Davide Sangiorgi**, and **Michele Alberti**. On coinductive equivalences for higher-order probabilistic functional programs. In *Principles of Programming Languages, 41st Annual Symposium, Proceedings*, pages 297–308. ACM, 2014.

[YHFDL14] **Akira Yoshimizu**, **Ichiro Hasuo**, **Claudia Faggian**, and **Ugo Dal Lago**. Measurements in proof nets as higher-order quantum circuits. In *Programming Languages and Systems, 23rd European Symposium, Proceedings*, volume 8410 of *LNCS*, pages 371–391. Springer, 2014.

[CDL14] **Raphaëlle Crubillé** and **Ugo Dal Lago**. On probabilistic applicative bisimulation and call-by-value λ-calculi. In *Programming Languages and Systems, 23rd European Symposium, Proceedings*, volume 8410 of *LNCS*, pages 209–228. Springer, 2014.

[DLP13a] **Ugo Dal Lago** and **Giulio Pellitta**. Complexity analysis in presence of control operators and higher-order functions. In *Logic for Programming, Artificial Intelligence, and Reasoning, 19th International Conference, Proceedings*, volume 8312 of *LNCS*, pages 258–273. Springer, 2013.

[DLP13b] **Ugo Dal Lago** and **Barbara Petit**. The geometry of types. In *Principles of Programming Languages, 40th Annual Symposium, Proceedings*, pages 167–178. ACM, 2013.

[ADL12] **Beniamino Accattoli** and **Ugo Dal Lago**. On the invariance of the unitary cost model for head reduction. In *Rewriting Techniques and Applications, 23rd International Conference, Proceedings*, volume 15 of *LIPIcs*, pages 22–37. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2012.

[BDL12] **Patrick Baillot** and **Ugo Dal Lago**. Higher-order interpretations and program complexity. In *Computer Science Logic, 26th International Workshop, Proceedings*, volume 16 of *LIPIcs*, pages 62–76. Schloss Dagstuhl - Leibniz-Zentrum fuer Informatik, 2012.

[DLG11] **Ugo Dal Lago** and **Marco Gaboardi**. Linear dependent types and relative completeness. In *Logic in Computer Science, 26th International Symposium, Proceedings*, pages 133–142. IEEE Computer Society, 2011.

[DLT11] **Ugo Dal Lago** and **Paolo Parisen Toldin**. A higher-order characterization of probabilistic polynomial time. In *Foundational and Practical Aspects of Resource Analysis, Second International Workshop, Revised Selected Papers*, volume 7177 of *LNCS*, pages 1–18. Springer, 2011.

[DLS10] **Ugo Dal Lago** and **Ulrich Schöepp**. Functional programming in sublinear space. In *Programming Languages and Systems, 19th European Symposium, Proceedings*, volume 6012 of *LNCS*, pages 205–225. Springer, 2010.

[DLH09] **Ugo Dal Lago** and **Martin Hofmann**. Bounded linear logic, revisited. In *Typed Lambda Calculi and Applications, 9th International Conference, Proceedings*, volume 5608 of *LNCS*, pages 80–94. Springer, 2009.

[DLM09a] **Ugo Dal Lago** and **Simone Martini**. Derivational complexity is an invariant cost model. In *Foundational and Practical Aspects of Resource Analysis, First International Workshop, Revised Selected Papers*, volume 6324 of *LNCS*, pages 100–113. Springer, 2009.

[DLM09b] **Ugo Dal Lago** and **Simone Martini**. On constructor rewrite systems and the lambda-calculus. In *International Conference on Automata, Languages and Programming, Proceedings*, volume 5556 of *LNCS*, pages 163–174. Springer, 2009.

[DLL08] **Ugo Dal Lago** and **Olivier Laurent**. Quantitative game semantics for linear logic. In *Computer Science Logic, 22nd International Workshop, Proceedings*, LNCS. Springer, 2008. To appear.

[DLMP07] **Ugo Dal Lago**, **Angelo Montanari**, and **Gabriele Puppis**. On the equivalence of automaton-based representations of time granularities. In *14th International Symposium on Temporal Representation and Reasoning, Proceedings*, pages 82–93. IEEE Computer Society, 2007.

[BCDL07] **Patrick Baillot**, **Paolo Coppola**, and **Ugo Dal Lago**. Light logics and optimal reduction: Completeness and complexity. In *Logic in Computer Science, 22nd International Symposium, Proceedings*, pages 421–430. IEEE Computer Society, 2007.

[DLM06] **Ugo Dal Lago** and **Simone Martini**. An invariant cost model for the lambda calculus. In *Logical Approaches to Computational Barriers, Second Conference on Computability in Europe*, volume 3988 of *LNCS*, pages 105–114. Springer, 2006.

[DL06] **Ugo Dal Lago**. Context semantics, linear logic and computational complexity. In *Logic in Computer Science, 21th International Symposium, Proceedings*, pages 169–178. IEEE Computer Society, 2006. Winner of the 2006 Kleene Award for the best student paper presented at the LICS conference.

[CDLRDR05] **Paolo Coppola**, **Ugo Dal Lago**, and **Simona Ronchi Della Rocca**. Elementary affine logic and the call-by-value lambda calculus. In *Typed Lambda Calculi and Applications, 7th International Conference, Proceedings*, volume 3461 of *LNCS*, pages 131–145. Springer, 2005.

[DL05] **Ugo Dal Lago**. The geometry of linear higher-order recursion. In *Logic in Computer Science, 20th International Symposium, Proceedings*, pages 366–375. IEEE Computer Society, 2005.

[DLH05] **Ugo Dal Lago** and **Martin Hofmann**. Quantitative models and implicit complexity. In *Foundations of Software Technology and Theoretical Computer Science, Proceedings*, volume 3821 of *LNCS*, pages 189–200. Springer, 2005.

[DLPT02] **Ugo Dal Lago**, **Marco Pistore**, and **Paolo Traverso**. Planning with a language for extended goals. In *Eighteenth National Conference of Artificial Intelligence, Proceedings*, pages 447–454. AAAI Press, 2002.

[DLM01] **Ugo Dal Lago** and **Angelo Montanari**. Calendars, time granularities and automata. In *Advances in Spatial and Temporal Databases, 7th International Symposium, Proceedings*, volume 2121 of *LNCS*, pages 279–298. Springer, 2001.