Alessandro Fantechi has studied Computer Science at University of Pisa in the late seventies, with a scolarship at the Scuola Normale Superiore di Pisa, earning a Laurea Degree in Computer Science at the University, together with the Diploma di Licenza of the Scuola Normale Superiore in November 1978. Since 2004 he is Full Professor at the School of Engineering of the University of Florence, where he teaches a course on Embedded Systems to the Bachelor in Information Engineering, and a course on Software Dependability at the Master in Information Engineering, and where he has been Associate Professor since 1995, at the Department of information Engineering (DINFO).
Previously, he has been Associate Professor at the University of Pisa since 1992, and Researcher at IEI - CNR since 1983.
He is a research associate of the Istituto di Scienza e Tecnologie dell'Informazione "A. Faedo" del CNR (previously, IEI), Pisa since 1992.
He has conducted research in the field of Software Engineering, concentrating in the last twenty years on the application of formal specification and verification methods. His main current research interests are on industrial applications of model checking and on software product lines and variability modeling. His research interests have included formal description techniques, temporal logic, distributed systems programming and modeling, applications of natural language understanding to requirement engineering. He has written over 120 papers for international journals and conferences, achieving the following citation records:
(GoogleScholar:)
Citations: 2732
h-index: 26
(Scopus:)
Citations: 1204
h-index: 19

The research activity of Alessandro Fantechi has often been conducted within European or National research projects, for which in many cases he also actively contributed to the proposal preparation. In particular, he had a leading role in the projects:
ESPRIT II LOTOSPHERE (1989-92), as IEI-CNR team leader FP4-ESPRIT 4 GUARDS (Generic Upgradable Architecture for Dependable Systems - 1996-99), as IEI-CNR team leader
 Nationally funded PRIN project SALADIN "Software Architectures and Languages to Coordinate Distributed Mobile Components" (1999-2001), as Univ. of Florence team leader.
 Nationally funded PRIN project QUACK "Innovative techniques for the formal specification and verification of fault-tolerant real-time embedded systems" (1999-2001), as Univ. of Florence team leader.
 IP6 project MODTRAIN – MODCONTROL "Standardization of an innovative Train Control and Monitoring System (TCMS) designed for future interoperable European trains" (2004-2007), as ISTI-CNR team leader.
 POR FESR 2014/2020 Tuscany Region project SISTER "Signaling & Sensing Technologies in Railway application" (2017-2019), as DINFO-UNIFI team leader.
POR FESR 2014/2020 Tuscany Region project INDIGO "Sviluppo di un dispositivo intelligente per la diagnosi e il monitoraggio dei sistemi ferroviari", (2017-2019) as DINFO-UNIFI team leader
He is currently involved in the ASTRail Shift2Rail project, as member of the ISTI-CNR team.

Alessandro Fantechi has maintained strict relations with industries as well, starting from his one year and a half experience in Olivetti in the early eighties, and then within several research, teaching and consulting collaborations with main Italian companies, as well as with several small and medium enterprises. Most of these companies are active in the fields of safety critical computer systems and A. Fantechi has had hence the opportunity to mature a significant experience, in particular on the Ada programming language, on the industrial applications of Formal Methods, on Software Certification, on Model-Based design, Automatic Code Generation, in particular in the railway signalling domain.
At this regard, it can be mentioned a 17-years long collaboration with General Electric Transportation Systems (formerly Siliani Harmon, now part of ALSTOM), that has included funding for research and technology transfer about the adoption of advanced software engineering techniques (structural testing, formal verification, model-based design and testing, requirement engineering,...) in the industrial development process, including funding for 5 PhD students in the time frame 2002-2015. Other industrial collaborations in the same domain have been funded by:
ALSTOM (2005-2008), COMESA (2010-2013) , Ansaldo Segnalamento Ferroviario (1994-1996)
Alessandro Fantechi has also offered from 1984 to 2015 more than 30 short courses on various themes regarding Software engineering, in particular Software development and certification according to guidelines in the avionic domain (DO178B), railway domain (EN50128), military domain (DEF STAN 00-55/56), to major Italian embedded system manufacturers, such as Agusta, Altran, Ansaldo Trasporti, Bombardier, Intecs, Officine Galileo, Selex.
The strict collaboration with companies working in the railway signaling domain has allowed Alessandro

Fantechi to gain a significant experience in an area that is at the border between technology transfer and advanced industrial research, that of the application of Formal Methods to the development and verification of systems in this domain. Due to this experience, he has been invited as a keynote speaker at:
- FM-I day, August 2012, CNAM, Paris
- FMICS, September 2013, Univ. of Madrid
- Workshop on Software Change Management and Approval Processes for Safety-critical Applications, DTU, Lyngby, August 2014.

He was General co-chair of ICECCS2004, Program Co-chair of FMICS 2008, General chair of VECOS 2013, General Co-Chair of SPLC2014, Program Co-chair of SERENE 2015, Co-chair of RSSRail 2017. He has been involved in the organization of several international conferences, among which FMOODS'99, FORTE/PSTV'00, ICSM2001, SRDS 2003, FME 2003, PFE-5 (2003), SEFM 2010, IFM2012, VAMOS2013, and has been member of the Program Committee in several editions of TACAS, FMOODS, FORTE, FMICS, VAMOS international conferences.
He is Member of the Steering Committee of the SPLC conference series since 2014.
He is regular reviewer for several international journals, including Science of Computer Programming, Safety Science, Formal Aspects of Computing.

He has tutored 10 PhD students of the Doctorate School in Information Engineering in the years 2002-2018.
From November 2007 to October 2014 he has been coordinator of the curriculum in Information Engineering at University of Florence.
From April 2005 to October 2007 and from November 2014 to present, he has been coordinator of the self-assessment team for the curriculum in Information Engineering at University of Florence.
From November 2016 is part of the Research Committee of DINFO Department, at University of Florence.

From November 2008 to November 2011 he has been the coordinator of the FMICS - Formal Methods for Industrial Critical Systems - Working group of ERCIM.
From December 2013 is President of the Tuscany section of AICA (Associazione Italiana per l'informatica e il Calcolo Automatico).
Member of AICA
Member of FME (Formal Methods Europe), since 2001
Founder member of AMT (Associazione per gli studi sulla mobilità in Toscana), of which he has been president from 2014 to 2015.
Member of CIFI (Collegio Ingegneri Ferroviari Italiani)
Member of LRTA (Light Rail Transit Association).
Member of the Interdepartmental research unit on Sustainable Mobility of University of Florence.

In 1984 he has spent 5 months as an invited visiting researcher of Technical University of Denmark, Computer Science Department, working at a project on Formal Methods combination, under the supervision of Prof. Dines Bjørner.
In the period 1999-2007, he has spent several invited long visits at Telecom Paristech (formerly Ecole Nationale Superieure des Telecommunications, ENST) in Paris, to work on the formalization of interactions between distributed components and services, with Prof. Elie Najm.
From March to August 2016 he has been Visiting Professor at the Denmark Technical University (DTU) in Lyngby, funded by a grant of Villum Foundation, to conduct research over compositional methods for the verification of railway interlocking systems, with Prof. Anne Haxthausen.
He has been called to take part in the PhD evaluation jury, several times from 1998 to 2016, at ENST/Telecom Paristech, Univ. of Grenoble, Univ. of Nice at Sophia Antipolis, Univ. of Maribor, Univ. of Malaga, Technical University of Denmark.

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National and international acknowledgments

EASST best paper awards - Ente assegnante: European Association of Software Science and Technology - Nazione: GBR - Rilevanza Europea - Anno: 2010, 15th International Workshop on Formal Methods for Industry Critical Systems - Pubblicazione premiata: A. Ferrari, D. Grasso, G. Magnani, A. Fantechi. The Metro Rio ATP case study, 15th International Workshop on Formal Methods for Industrial Critical Systems (FMICS 2010) . Antwerp, Belgio, Settembre, LNCS vol. 6371, p. 1-16, -, ISBN: 9783642158971 - Vinto il: 21/09/2010

Presidente comitato programma di congresso internazionale - Titolo congresso: FMICS 2008: 13th International ERCIM Workshop on Formal Methods for Industrial Critical Systems - Anno: 2008

Presidente comitato programma di congresso internazionale - Titolo congresso: RSSRail 2017 - International Conference on Reliability, Safety and Security of Railway Systems:
Modelling, Analysis, Verification and Certification - Anno: 2017

Presidente comitato programma di congresso internazionale - Titolo congresso: SPLC 2014 - 18th International Software Product Line Conference
Florence, Italy, September 15-19, 2014 - Anno: 2014

Presidente comitato programma di congresso internazionale - Titolo congresso: IEEE International Conference on Engineering of Complex Computer Systems (ICECCS 2004) - Anno: 2004

Presidente comitato programma di congresso internazionale - Titolo congresso: 7th International Workshop on Software Engineering for Resilient Systems - SERENE 2015 - Anno: 2015

Presidente comitato programma di congresso internazionale - Titolo congresso: 7th International Workshop on Verification and Evaluation of Computer and Communication Systems - VECOS 2013 - Anno: 2013

Coordinatore ERCIM FMICS (Formal Methods for Industrial Critical Systems) Working Group - Istituzione: European Research Consortium for Informatics and Mathematics - URL: https://www.ercim.eu - Dal: 01/01/2008 al: 01/01/2011

Principal scientific publications

Laura Carnevali, Alessandro Fantechi, Gloria Gori, Enrico Vicario (2019). Stochastic modeling and analysis of road–tramway intersections. INNOVATIONS IN SYSTEMS AND SOFTWARE ENGINEERING, p. 1-16, ISSN: 1614-5046, doi: 10.1007/s11334-019-00355-1 - Articolo in rivista

Ferrari, Alessio, Gori, Gloria, Rosadini, Benedetta, Trotta, Iacopo, Bacherini, Stefano, Fantechi, Alessandro, Gnesi, Stefania (2018). Detecting requirements defects with NLP patterns: an industrial experience in the railway domain. EMPIRICAL SOFTWARE ENGINEERING, vol. ..., p. 1-50, ISSN: 1382-3256, doi: 10.1007/s10664-018-9596-7 - Articolo in rivista

2. Paganelli Federica, Ambra Terence, Fantechi Alessandro, Giuli Dino (2017). Formalizing REST APIs for web-based communication and SIP interworking. TELECOMMUNICATION SYSTEMS, p. 1-19, ISSN: 1018-4864, doi: 10.1007/s11235-016-0271-2 - **Articolo in rivista**

3. BONACCHI, ANDREA, FANTECHI, ALESSANDRO, Bacherini, S., Tempestini, M. (2016). Validation process for railway interlocking systems. SCIENCE OF COMPUTER PROGRAMMING, vol. 128, p. 2-21, ISSN: 0167-6423, doi: 10.1016/j.scico.2016.04.004 - **Articolo in rivista**

4. ter Beek, Maurice H., FANTECHI, ALESSANDRO, GNESI, STEFANIA, Mazzanti, Franco (2016). Modelling and analysing variability in product families: Model checking of modal transition systems with variability constraints. THE JOURNAL OF LOGICAL AND ALGEBRAIC METHODS IN PROGRAMMING, vol. Volume 85, Pages 287–315, p. 287-315, ISSN: 2352-2208, doi: 10.1016/j.jlamp.2015.11.006 - **Articolo in rivista**

5. FANTECHI, ALESSANDRO, Francesco Flammini, GNESI, STEFANIA (2014). Formal methods for railway control systems. INTERNATIONAL JOURNAL ON SOFTWARE TOOLS FOR TECHNOLOGY TRANSFER, vol. 16, p. 643-646, ISSN: 1433-2779, doi: 10.1007/s10009-014-0342-1 - **Articolo in rivista**

6. Alessio Ferrari, Alessandro Fantechi, Gianluca Magnani, Daniele Grasso, Matteo Tempestini (2013). The Metrô Rio case study. SCIENCE OF COMPUTER PROGRAMMING, vol. 78, p. 828-842, ISSN: 0167-6423, doi: 10.1016/j.scico.2012.04.003 - **Articolo in rivista**

7. FERRARI, ALESSIO, FANTECHI, ALESSANDRO, GNESI, STEFANIA, MAGNANI, GIANLUCA (2013). Model-Based Development and Formal Methods in the Railway Industry. IEEE SOFTWARE, vol. 30, p. 28-34, ISSN: 0740-7459, doi: 10.1109/MS.2013.44 - **Articolo in rivista**

8. Jonathan Michaux, Elie Najm, Alessandro Fantechi (2013). Session types for safe Web service orchestration. JOURNAL OF LOGIC AND ALGEBRAIC PROGRAMMING, vol. 82, p. 282-310, ISSN: 1567-8326, doi: 10.1016/j.jlap.2013.05.004 - **Articolo in rivista**

9. Tommaso Magherini, Alessandro Fantechi, Chris D. Nugent, Enrico Vicario (2013). Using Temporal Logic and Model Checking in Automated Recognition of Human Activities for Ambient-Assisted Living. IEEE TRANSACTIONS ON HUMAN-MACHINE SYSTEMS, vol. 43, p. 509-521, ISSN: 2168-2291, doi: 10.1109/TSMC.2013.2283661 - **Articolo in rivista**

10. A. Fantechi, S. Gnesi, A. Lapadula, F. Mazzanti, R. Pugliese, F. Tiezzi (2012). A Logical Verification Methodology for Service-Oriented Computing. ACM TRANSACTIONS ON SOFTWARE ENGINEERING AND METHODOLOGY, vol. 21(3), p. 1-46, ISSN: 1049-331X, doi: 10.1145/2211616.2211619 - **Articolo in rivista**

11. Alessio Ferrari, Gianluca Magnani, Daniele Grasso, Alessandro Fantechi, Matteo Tempestini (2011). Adoption of Model-Based Testing and Abstract Interpretation by a Railway Signalling Manufacturer. INTERNATIONAL JOURNAL OF EMBEDDED AND REAL-TIME COMMUNICATION SYSTEMS, vol. 2, p. 42-61, ISSN: 1947-3176, doi: 10.4018/jertcs.2011040103 - **Articolo in rivista**

12. M. H. ter Beek, FANTECHI, ALESSANDRO, GNESI, STEFANIA, F. Mazzanti (2011). A state/event-based model-checking approach for the analysis of abstract system properties.. SCIENCE OF COMPUTER PROGRAMMING, vol. 76, p. 119-135, ISSN: 0167-6423 - **Articolo in rivista**

13. M. Banci, A. Fantechi, S. Gnesi (2008). Model driven development of railway systems using diversity. COMPUTER SYSTEMS SCIENCE AND ENGINEERING, vol. 23, p. 329-335, ISSN: 0267-6192 - **Articolo in rivista**

14. FANTECHI, ALESSANDRO, GNESI, STEFANIA, Semini, Laura (2017). Optimizing Feature Interaction Detection. In: Critical Systems: Formal Methods and Automated Verification - Joint 22nd International Workshop on Formal Methods for Industrial Critical Systems and 17th International Workshop on Automated Verification of Critical Systems, FMICS-AVoCS 2017 - Lecture Notes in Computer Science. vol. 10471, p. 201-216, Springer Verlag, ISBN: 9783319671123, ita, 2017, doi: 10.1007/978-3-319-67113-0_13 - **Contributo in Atti di convegno**

15. Fantechi, Alessandro, Haxthausen, Anne E., Macedo, Hugo D. (2017). Compositional verification of interlocking systems for large stations. In: Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics). vol. 10469, p. 236-252, Springer Verlag, ISBN: 9783319661964, ita, 2017, doi: 10.1007/978-3-319-66197-1_15 - **Contributo in Atti di convegno**

16. Fantechi, Alessandro, Haxthausen, Anne E., Nielsen, Michel Boje Randahl (2017). Model Checking Geographically Distributed Interlocking Systems Using UMC. In: Proceedings - 2017 25th Euromicro International Conference on Parallel, Distributed and Network-Based Processing, PDP 2017. p. 278-286,

Institute of Electrical and Electronics Engineers Inc., ISBN: 9781509060580, rus, 2017, doi: 10.1109/PDP.2017.66 - **Contributo in Atti di convegno**

17. Macedo, Hugo Daniel, Fantechi, Alessandro, Haxthausen, Anne E. (2017). Compositional model checking of interlocking systems for lines with multiple stations. In: Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics). vol. 10227, p. 146-162, Springer Verlag, ISBN: 9783319572871, usa, 2017, doi: 10.1007/978-3-319-57288-8_11 - **Contributo in Atti di convegno**

18. Fantechi Alessandro (2016). Formal techniques for a data-driven certification of advanced railway signalling systems. In: Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics). vol. 9933, p. 231-245, Springer Verlag, ISBN: 9783319459424, ita, 2016, doi: 10.1007/978-3-319-45943-1_16 - **Contributo in Atti di convegno**

19. Fantechi, Alessandro, Macedo, Hugo Daniel, Haxthausen, Anne Elisabeth (2016). Compositional verification of multi-station interlocking systems. In: Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics). vol. 9953, p. 279-293, Springer Verlag, ISBN: 9783319471686, doi: 10.1007/978-3-319-47169-3_20 - **Contributo in Atti di convegno**

20. Alessandro Fantechi (2012). The Role of Formal Methods in Software Development for Railway Applications. In: Francesco Flammini. Railway Safety, Reliability, and Security. p. 282-297, IGI, ISBN: 9781466616431, doi: 10.4018/978-1-4666-1643-1.ch012 - **Contributo in volume (Capitolo o Saggio)**

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