Curriculum Vitæ

Carlos E. Budde

Personal information		Key performance indicators	
Full name:	Carlos Esteban Budde	N° publications (ORCiD):	26
Birth date:	January 15th, 1988	N° citations (Google scholar):	227
Homepage:	webapps.unitn.it/du/en/Persona/PER0235360	N° PCs (intl. conferences):	3
E-mail:	carlosesteban.budde@unitn.it	Scientific events attended:	25
Tel:	+39 046 128 2098	MSc|BSc students supervised:	3|9

Top activities & publications

Research:
- Paper in TACAS 2021, *Replicating RESTART with Prolonged Retrials: An Experimental Report*, on the reproducibility of CS research—see the artifact in Figshare.
- Best short-paper award in the 17th Intl. Conf. on Quant. Eval. of Sys. (QEST 2020), for the contribution *The Dynamic Fault Tree Rare Event Simulator*.

Teaching & outreach:
- Co-organiser of the PM 2021 workshop, colocated with CONCUR @ QONFEST'21.
- Main lecturer of the CS (MSc.) course *Advanced logic*, University of Twente (2020).
- Invited talk in the Risk & Resilience festival (DATA track), University of Twente (2019).

Employment

Assistant professor type A (RTDa) in the Dept. of CS and Engineering. **2021**–today
University of Trento in Trento, Italy.
Manager: Prof. Fabio Massacci.

Post-doctoral fellow (researcher) in the Formal Methods & Tools group, **2017**–**2021**
including collaboration with Maintenance-devel. Dept. of the Dutch Railways.
University of Twente in Enschede, The Netherlands.
Manager: Prof. Mariëlle Stoelinga.

Studies

National University of Córdoba (UNC), Córdoba, Argentina.
(second largest university in Argentina; top 20 in South America, top 600 worldwide)
Faculty of Mathematics, Astronomy, Physics and Computer Science (FAMAF).

PhD in Computer Science. **2012**–**2017**
Thesis: Automation of Importance Splitting Techniques for Rare Event Simulation.
Area: Rare event simulation with multilevel splitting.
Supervisor: Prof. Pedro R. D'Argenio (Argentina).
Co-supervisor: Prof. Holger Hermanns (Germany).

MSc in Computer Science. **2010**–**2012**
Final project: Fully measurable non-determinism in continuous probabilistic processes.
Grade point average: $9.74 / 10$ (highest university-wide).

BSc: Computer Analyst. **2007**–**2010**
Grade point average: $9.67 / 10$.

Honors & awards	**Best short-paper award** in QEST 2020 Contribution: *The Dynamic Fault Tree Rare Event Simulator.*	2020
	National University of Córdoba *Best grade point average of the UNC, year 2011.*	2012
	National University of Córdoba *First flagman escort substitute of the UNC (in virtue of the grade point average)*	2011
	National University of Córdoba *Premio Universidad - Honorific Mention (in virtue of the grade point average)*	2011
	FAMAF, National University of Córdoba *Flag bearer of FAMAF.*	2011
	FAMAF, National University of Córdoba *Second flagman escort of FAMAF.*	2010

Interests

I evaluate properties formally on mathematical models using Monte Carlo simulation. I aim to design a theory of automated algorithms for rare event simulation, implementing my ideas and testing their performance in reality. My case studies assess safety and security for industrial systems, e.g. very rare (but critical) failures and attacks described as fault and attack trees.

My techniques have demonstrated good performance for general stochastic models—i.e. any distribution you like—taking the same input as probabilistic model checking. I intend to extend the automated application of importance splitting to rare event analysis on hybrid systems, where currently only ad hoc approaches are applicable

Keywords: • rare event simulation • importance splitting • automation of Monte Carlo simulation techniques • formal methods in Computer Science • modelling of stochastic systems • process semantics • Stochastic Automata • GPGPUs for scientific computations • HPC.

Software tools

Finite Improbability Generator (FIG) [main-dev]: statistical model checker developed in my PhD, that implements rare event simulation via importance splitting. The importance function is *automatically and compositionally derived* from the model and properties, specified as an Input/Output Stochastic Automata, or in the JANI Specification format.

The Dynamic Fault Tree Rare Event Simulator (DFTRES) [contributor]: statistical model checker that implements rare event simulation via importance sampling on Markovian systems. The change of measure is *automatically computed* from the model and properties, specified as a Fault Maintenance Tree in Galileo, or in the JANI Specification format.

Bluemoon [main-dev]: prototype developed in my PhD, which uses RESTART to simulate rare events. The importance function is *automatically derived* from the model and properties analyzed, which must be a continuous- or discrete-time Markov chain in PRISM syntax.

All my tools are (and will be) open source:
FIG, DFTRES, and Bluemoon are distributed under the GNU General Public License (ver. 3).

Extended research visits

Three visits to the Northern Paris CS Lab, in Université Sorbonne Paris Nord. Total: **4 weeks**. Collaboration with Prof. Laure Petrucci.	2018–2019
Four visits to the Depend. Sys. & Soft. group, in the University of Saarland. Total: **10 months**. Collaboration with Prof. Holger Hermmans.	2013–2019

Scholarships & grants

National PhD scholarship   2012.04–2017.04
CONICET (top two institution for South America in the natureINDEX)

Intel Grant to Academic Excellency   2010.01–2011.12
Intel® Argentina Software Development Center (ASDC)

Grant 500x500   2007.03–2011.03
Córdoba Province Gov.—Ministerio de Industria, Comercio y Trabajo.

Publications
(peer-reviewed)

- **Journal papers** include the SJR quartile and H-index of the journal when published.
- **Conferences papers** include the GGS and CORE ranking of the conference (if available).

1. Carlos E. Budde, Christina Kolb and Mariëlle Stoelinga (2021). "Attack Trees vs. Fault Trees: two sides of the same coin from different currencies". In: *QEST*. vol. 12846. LNCS. **GGS**: B-. Springer Nature Switzerland, pp. 457–467. DOI: 10.1007/978-3-030-85172-9_24

2. Mariëlle Stoelinga et al. (2021). "The Marriage Between Safety and Cybersecurity: Still Practicing". In: *SPIN*. vol. 12864. LNCS. Springer Nature Switzerland, pp. 3–21. DOI: 10.1007/978-3-030-84629-9_1

3. Carlos E. Budde and Mariëlle Stoelinga (2021). "Efficient Algorithms for Quantitative Attack Tree Analysis". In: *CSF*. **CORE**: A, **GGS**: A. IEEE Computer Society, pp. 501–515. DOI: 10.1109/CSF51468.2021.00041

4. Carlos E. Budde, Arnd Hartmanns et al. (2021). "On Correctness, Precision, and Performance in Quantitative Verification". In: *ISoLA*. vol. 12479. LNCS. **CORE**: C. Springer International Publishing, pp. 216–241. DOI: 10.1007/978-3-030-83723-5_15

5. Carlos E. Budde and Arnd Hartmanns (2021). "Replicating RESTART with Prolonged Retrials: An Experimental Report". In: *TACAS*. vol. 12652. LNCS. **CORE**: A, **GGS**: A+. Springer International Publishing, pp. 373–380. DOI: 10.1007%2F978-3-030-72013-1_21

6. Jaime Arias et al. (2020). "Hackers vs. Security: Attack-Defence Trees as Asynchronous Multi-Agent Systems". In: *ICFEM*. vol. 12531. LNCS. **CORE**: B, **GGS**: B-. Springer International Publishing, pp. 3–19. DOI: 10.1007/978-3-030-63406-3_1

7. Carlos E. Budde, Enno Ruijters and Mariëlle Stoelinga (2020). "The Dynamic Fault Tree Rare Event Simulator". In: *QEST*. vol. 12289. LNCS. **GGS**: B-. Springer International Publishing, pp. 233–238. DOI: 10.1007/978-3-030-59854-9_17

8. Carlos E. Budde, Pedro R. D'Argenio, Arnd Hartmanns and Sean Sedwards (2020). "An efficient statistical model checker for nondeterminism and rare events". In: *International Journal on Software Tools for Technology Transfer* 23 (6). **SJR**: Q2, H-idx 55, pp. 759–780. DOI: 10.1007/s10009-020-00563-2

9. Raúl E. Monti, Carlos E. Budde and Pedro R. D'Argenio (2020). "A compositional semantics for Repairable Fault Trees with general distributions". In: *LPAR*. vol. 73. EPiC Series in Computing. **CORE**: A, **GGS**: B. EasyChair, pp. 354–372. DOI: 10.29007/p16v

10. Carlos E. Budde and Mariëlle Stoelinga (2020). "Automated Rare Event Simulation for Fault Tree Analysis via Minimal Cut Sets". In: *MMB*. vol. 12040. LNCS. Springer International Publishing, pp. 259–277. DOI: 10.1007/978-3-030-43024-5_16

11. Carlos E. Budde (2020). "FIG: The Finite Improbability Generator". In: *TACAS*. vol. 12078. LNCS. **CORE**: A, **GGS**: A+. Springer International Publishing, pp. 483–491. DOI: 10.1007/978-3-030-45190-5_27

12. Carlos E. Budde, Marco Biagi et al. (2020). "Rare Event Simulation for Non-Markovian Repairable Fault Trees". In: *TACAS*. vol. 12078. LNCS. **CORE**: A, **GGS**: A+. Springer International Publishing, pp. 463–482. DOI: 10.1007/978-3-030-45190-5_26

13. Carlos E. Budde, Pedro R. D'Argenio and Arnd Hartmanns (2019). "Automated compositional importance splitting". In: *Science of Computer Programming* 174. **SJR**: Q3, H-idx 64, pp. 90–108. DOI: 10.1016/j.scico.2019.01.006

14. Enno Ruijters et al. (2019). "FFORT: A benchmark suite for fault tree analysis". In: *ESREL*. Research Publishing, pp. 878–885. DOI: 10.3850/978-981-11-2724-3_0641-cd

15. Alessandro Abate, Carlos E. Budde, Nathalie Cauchi, Khaza Anuarul Hoque et al. (2018). "Assessment of Maintenance Policies for Smart Buildings: Application of Formal Methods to Fault Maintenance Trees". In: *Proceedings of the European Conference of the PHM Society*. Vol. 4. 1. PHM society. DOI: 10.36001/phme.2018.v4i1.385. URL: https://www.phmpapers.org/index.php/phme/article/view/385

16. Alessandro Abate, Carlos E. Budde, Nathalie Cauchi, Arnaud van Harmelen et al. (2018). "Modelling Smart Buildings Using Fault Maintenance Trees". In: *EPEW*. vol. 11178. LNCS. Springer International Publishing, pp. 110–125. DOI: 10.1007/978-3-030-02227-3_8

17. Carlos E. Budde, Pedro R. D'Argenio, Arnd Hartmanns and Sean Sedwards (2018). "A Statistical Model Checker for Nondeterminism and Rare Events". In: *TACAS*. vol. 10806. LNCS. **CORE**: A, **GGS**: A+. Springer International Publishing, pp. 340–358. DOI: 10.1007/978-3-319-89963-3_20

18. Carlos E. Budde, Pedro R. D'Argenio and Arnd Hartmanns (2017). "Better Automated Importance Splitting for Transient Rare Events". In: *SETTA*. vol. 10606. LNCS. Springer International Publishing, pp. 42–58. DOI: 10.1007/978-3-319-69483-2_3

19. Carlos E. Budde, Christian Dehnert et al. (2017). "JANI: Quantitative Model and Tool Interaction". In: *TACAS*. vol. 10206. LNCS. **CORE**: A, **GGS**: A+. Springer Berlin Heidelberg, pp. 151–168. DOI: 10.1007/978-3-662-54580-5_9

20. Pedro R. D'Argenio et al. (2017). "The Road from Stochastic Automata to the Simulation of Rare Events". In: *ModelEd, TestEd, TrustEd*. Vol. 10500. LNCS. Springer International Publishing, pp. 276–294. DOI: 10.1007/978-3-319-68270-9_14

21. Carlos E. Budde, Pedro R. D'Argenio and Raúl E. Monti (2017). "Compositional Construction of Importance Functions in Fully Automated Importance Splitting". In: *VALUE-TOOLS*. ACM, pp. 30–37. DOI: 10.4108/eai.25-10-2016.2266501

22. Carlos E. Budde, Pedro R. D'Argenio and Holger Hermanns (2015). "Rare Event Simulation with Fully Automated Importance Splitting". In: *EPEW*. vol. 9272. LNCS. Springer International Publishing, pp. 275–290. DOI: 10.1007/978-3-319-23267-6_18

23. Carlos E. Budde, Pedro R. D'Argenio, Pedro Sánchez Terraf et al. (2014). "A Theory for the Semantics of Stochastic and Non-deterministic Continuous Systems". In: *ROCKS 2012*. Vol. 7453. LNCS. Springer Berlin Heidelberg, pp. 67–86. DOI: 10.1007/978-3-662-45489-3_3

24. Félix Rojo et al. (2013). "Enhanced transport through desorption-mediated diffusion". In: *Phys. Rev. E* 87 (1). **SJR**: Q1, H-idx 304, p. 012115. DOI: 10.1103/PhysRevE.87.012115

25. Carlos E. Budde (2012). "A theory for the semantics of continuous systems with stochastic and structural non-determinism". In: *YR-CONCUR*. URL: http://dsg.famaf.unc.edu.ar/sites/default/files/pdf/papers/paper-291.pdf

Contributions to scientific community

Program Chairs & Committees

Co-organiser of the PM 2021 workshop @ QONFEST'21.	2021
Program committee member of GraMSec 2020.	2020
Publicity chair of QEST 2020.	2020
Program committee member of QEST 2020.	2020
Artifact evaluation committee member of TACAS 2020.	2020
Program committee member of FMICS 2020.	2020

Peer review in journals

- ❧ IEEE Transactions on Software Engineering.
- ❧ ACM Transactions on Modeling and Computer Simulation.
- ❧ Reliability Engineering & System Safety.
- ❧ Progress in Nuclear Energy.
- ❧ Journal of Risk and Reliability.
- ❧ PeerJ Computer Science.
- ❧ International Journal on Software Tools for Technology Transfer.
- ❧ Operations Research Perspectives.

Peer review in conferences and workshops

• 18th Intl. Conf. on Quantitative Evaluation of SysTems.	QEST 2021
• 19th Intl. Conf. on Formal Modeling and Anal. of Timed Systems.	FORMATS 2021
• 27th Intl. Conf. on Tools and Algorithms for the Construction and Analysis of Systems (papers & artifacts).	TACAS 2021
• 12th ACM/IEEE Intl. Conf. on Cyber-Physical Systems	ICCPS 2021
• 17th Intl. Conf. on Quantitative Evaluation of SysTems	QEST 2020
• 7th Intl. Workshop on Graphical Models for Security	GraMSec 2020
• 30th European Safety and Reliability Conference / 15th Probabilistic Safety Assessment and Management Conference	ESREL-PSAM 2020
• 4th Workshop on Models for Formal Analysis of Real Systems	MARS 2020
• 26th Intl. Conf. on Tools and Algorithms for the Construction and Analysis of Systems (artifacts)	TACAS 2020
• 5th Symposium on Dependable Software Engineering	SETTA 2019
• 29th European Safety and Reliability Conference	ESREL 2019
• Annual Conference of the PHM Society	PHM 2018
• 15th Intl. Conf. on Quantitative Evaluation of SysTems	QEST 2018
• 34th IFIP International Conference on Formal Techniques for Distributed Objects, Components and Systems	FORTE 2014

Participation in scientific projects

• PAMPAS2: Parallel Algorithms for Model-checking and Parameter Synthesis. Funded by EP NUFFIC—Van Gogh programme (EU)	2019–2020
• SUCCESS: SecUre aCCESSibility for the internet of things. Funded by CHIST-ERA (EU)	2019.03–2019.11
• SEQUOIA: Smart maintenance optimization via big data & fault tree analysis. Funded by NWO, ProRail, NS (project nr. 15474).	2017.06–2021.06
• Foundations, algorithms and tools for the development of dependable distributed systems. Funded by FONCYT - ANPCyT (PICT 2012-1823).	2013–2016
• MEALS: Mobility between Europe and Argentina applying Logics to Systems. Funded by 7FP, European Commission (295261).	2011–2015

- Foundations and techniques for the reliability analysis of concurrent stochastic systems. Funded by SeCyT-UNC (05/B497). — 2012−2013

- Foundations, algorithms and tools for the construction of dependable programs. Funded by SeCyT-UNC (05/BP02). — 2012−2013

Work visits & collaborations

Invited research visit to the Software Modeling and Verification group in the RWTH Aachen University, led by Prof. Dr. Ir. Dr. h. c. Joost-Pieter Katoen. — 2019.11

Invited research visits to the LIPN in Université Paris 13
Project: *PAMPAS2*. — 2019.06-07

Invited research visit to the Dependable Systems & Software group
from the Saarland University, led by Univ.-Prof. Dr-Ing. Holger Hermanns. — 2019.03

Invited research visit to the LIPN in Université Paris 13
Project: *PAMPAS*. — 2018.11

Invited research visit to the Software Technologies Lab
in the University of Florence, led by Prof. Dr-Ing. Enrico Vicario.
Project: *SEQUOIA* (NWO project nr. 15474) — 2018.07

Research visit to the Formal Methods and Tools group
in the University of Twente, led by Prof. Dr. Jaco C. van de Pol.
Project: *Foundations, algorithms and tools for the development of dependable distributed systems* (PICT 2012-1823) — 2016.11

Research visit to José Villén-Altamirano from the Departamento de Matemática Aplicada a las Tecnologías de la Información in the Universidad Politécnica de Madrid.
Project: *Foundations, algorithms and tools for the development of dependable distributed systems* (PICT 2012-1823) — 2016.11

Research visit to the Software Modeling and Verification group in the RWTH Aachen University, led by Prof. Dr. Ir. Dr. h. c. Joost-Pieter Katoen.
Project: *Mobility between Europe and Argentina applying Logics to Systems* (MEALS) — 2015.06

Collaborations with the Dependable Systems & Software group from the Saarland University, led by Univ.-Prof. Dr-Ing. Holger Hermanns.
This comprised three visits, of three months each, in the following periods:
Apr–Jul 2013; Jun–Aug 2014; Jun–Aug 2015.
Project: *Mobility between Europe and Argentina applying Logics to Systems* (MEALS) — 2013−2015

Teaching

(UTwente)

FMT, University of Twente, the Netherlands.

Lecturing

- ❧ Advanced Logic (main lecturer; course link: 192111092)   Academic Year 2019: Q4
- ❧ Risk Management (co-organiser & lecturer; CuriousU summer school)   A.Y. 2018: Q4

Teaching assistantships

- ❧ Languages & Machines (module *Discr. Struct. & Efficient Algo.*)   A.Y. 2019: Q2
- ❧ Algorithms, Datastructures & Complexity (module *Discr. Struct. & Efficient Algo.*)   A.Y. 2019: Q2
- ❧ Languages & Machines (module *Discr. Struct. & Efficient Algo.*)   A.Y. 2018: Q2
- ❧ Algorithms, Datastructures & Complexity (module *Discr. Struct. & Efficient Algo.*)   A.Y. 2018: Q2
- ❧ Languages & Machines (module *Discr. Struct. & Efficient Algo.*)   A.Y. 2017: Q2

MSc final projects supervision

- M. J. W. Peppelman: 2020
  Encoding failure probability dependencies in Bayesian networks; Defeating the Fault Tree Analysis assumption of independent Basic Events.
  [Entry in the library catalogue of the University of Twente.](#)
- H. J. Alblas: 2020
  Predictive maintenance of Dutch civil infrastructure: a structured approach.
  PDF URI: [essay.utwente.nl/80517/1/Alblas_MA_EEMCS.pdf.](#)
  [Entry in the library catalogue of the University of Twente.](#)

BSc final projects supervision

- Z. Krol: 2021:Q2
  A new approach to visualizing FMEA data.
- M. Klotz: 2020:Q4
  Extending the shunting plan generator of the Dutch Railways with non-service train traffic.
- J. Karsten: 2020:Q4
  Crunching Attack Trees: Efficient Algorithms for Computation of Metrics.
- E. Constantinescu: 2020:Q4
  An in-depth approach to fitting probability distributions using Evolutionary Algorithms.
- C. Plentinger: 2020:Q2
  GUI for **FIG***: Visualising simulation results.*
- V. Sudhakar: 2019:Q4
  Implementing topological value iteration for Markov decision processes in the Modest Toolset
- PJ. Roelofs: 2018:Q2
  Determining Long Run Properties of Complex Models using Statistical Model Checking.
- J. A. de Bie: 2018:Q4
  PTA as an approach to fault tree analysis.
- T. Braams: 2018:Q4
  Modelling Degradation of Physical Objects in Fault Maintenance Trees.

Teaching (UNC)	**FAMAF, National University of Córdoba, Argentina.**

Teaching assistantships

❧ Parallel computing	2016.04 – 2016.07
❧ Operating systems	2011.08 – 2011.12
❧ Networks and distributed systems	2011.03 – 2011.07
❧ Operating systems	2010.08 – 2010.12
❧ Introduction to algorithms	2010.03 – 2010.07
❧ Operating systems	2009.08 – 2009.12
❧ Algorithms and data structures II	2009.03 – 2009.07

MSc final projects supervision

- M. Hunicken: 2018
  Simulación de eventos raros con Importance Splitting, extendiendo **FIG** *con Fixed Effort y Fixed Sucess.*
  PDF URI: [rdu.unc.edu.ar/handle/11086/10742](#) (ES).
  [Entry in FAMAF library catalogue.](#)

Scientific events attended

- 18th International Conference on Quantitative Evaluation of SysTems—QEST'21   2021
  Online.

- 34th IEEE Computer Security Foundations Symposium—CSF'21.   2021
  Online.

- 23rd edition of the European Joint Conferences on Theory and Practice of   2020
  Software—ETAPS'20.
  Online.

- 17th International Conference on Quantitative Evaluation of SysTems—QEST'20   2020
  Online.

- Stochastic Hybrid Systems workshop.   2019
  Wettringen, Germany.

- 15th European Workshop on Performance Engineering—EPEW'18.   2018
  Paris, France.

- Meeting for Rigorous dependability analysis using model checking techniques   2018
  for stochastic systems—ROCKS Workshop meeting 2018.
  Freising, Germany.

- 4th European Conference of the Prognostics and Health Management   2018
  society—PHME'18
  Utrecht, the Netherlands.

- 21st edition of the European Joint Conferences on Theory and Practice of   2018
  Software—ETAPS'18.
  Thessaloniki, Greece.

- Lorentz workshop "Safety of Future Systems: Science meets Industry."   2018
  Leiden, the Netherlands.

- 5th Conference for ICT-Research in the Netherlands—ICT.OPEN'18   2018
  Amersfoort, the Netherlands.

- 3rd Symposium on Dependable Software Engineering: Theories, Tools and   2017
  Applications—SETTA'17.
  Changsha, China.

- ExploRail symposium—EXPLORAIL'17   2017
  Amersfoort, the Netherlands.

- Meeting for Rigorous dependability analysis using model checking techniques   2017
  for stochastic systems—ROCKS Meeting 2017.
  Münster, Germany.

- 3rd International Summer School for Big Data—BBDC/ScaDS 2017.   2017
  Munich, Germany.

- 10th International Conference on Performance Evaluation Methodologies   2016
  and Tools—VALUETOOLS'16.
  Taormina, Italy.

- 4th Argentinean Workshop on Foundations for the Automatic Analysis   2016
  and Construction of Software—FACAS'16.
  Alto delta del Paraná, Argentina.

- 26th International Conference on Concurrency Theory—CONCUR'15.   2015
  Madrid, España.

- 12th European Workshop on Performance Engineering—EPEW'15.   2015
  Madrid, España.

- 3rd Argentinean Workshop on Foundations for the Automatic Analysis   2015
  and Construction of Software—FACAS'15.
  Alto delta del Paraná, Argentina.

- 11th Summer School on Modelling and Verification of Parallel Processes   2014
  MOVEP'14. Nantes, France.

- 2nd Argentinean Workshop on Foundations for the Automatic Analysis   2014
  and Construction of Software—FACAS'14.
  Alto delta del Paraná, Argentina.

- 24th International Conference on Concurrency Theory—CONCUR'13.   2013
  Ciudad Autónoma de Buenos Aires, Argentina.

- 10th International Conference on Quantitative Evaluation of SysTems   2013
  QEST'13. Ciudad Autónoma de Buenos Aires, Argentina.

- 1st Argentinean Workshop on Foundations for the Automatic Analysis   2013
  and Construction of Software—FACAS'13.
  Valle Hermoso, Argentina.

Professional development

(including post-graduate courses)

Supervising Students (10 h)   2019
  Lecturer: Drs. Marleen de Haan, University of Twente, The Netherlands.

Time Management (9 h)   2019
  Lecturer: Yvon van Leeuwen, Radboud Universiteit (Nijmegen), The Netherlands.

Modelling and Analysis of Probabilistic Timed Systems (12.5 h)   2015
  Lecturer: Joost-Pieter Katoen from the RWTH Aachen University, Germany.
  22nd Computer Science Summer School, Universidad Nacional de Río Cuarto.

Introduction to Probabilistic Model Checking (12.5 h)   2015
  Lecturer: Christel Baier from the Technische Universität Dresden, Germany.
  22nd Computer Science Summer School, Universidad Nacional de Río Cuarto.

Aceleración con GPUs: arquitectura y programación CUDA. (12.5 h)   2014
  Lecturer: Manuel Ujaldón from the University of Málaga, España.
  21st Computer Science Summer School, Universidad Nacional de Río Cuarto.

Artificial Intelligence (64 h)   2013
  Lecturer: Dr. J. Hoffmann from the Saarland University, Germany.
  C. S. Dept., Saarland University.

Optimization (68 h)   2013
  Lecturers: Dr. A. Karrenbauer and Dr. M. Mnich from the Max-Planck-Institut
  für Informatik, Germany.
  MPI-Inf, Saarland University.

Introducción a la Computación Heterogénea. (12.5 h)   2013
  Lecturers: Dr. Nicolás Wolovick and Lic. Carlos Bederián from FAMAF, Argentina.
  20th Computer Science Summer School, Universidad Nacional de Río Cuarto.

Quantitative Security Analysis. (12.5 h)   2013
  Lecturer: Dr. Boris Köpf from the IMDEA Software Institute, España.
  20th Computer Science Summer School, Universidad Nacional de Río Cuarto.

Series de Tiempo (60 h)   2012
   Lecturer: Dr. O. H. Bustos from FAMAF, Argentina.
   FAMAF, National University of Córdoba.

Criptografía (60 h)   2011
   Lecturer: Dr. D. Penazzi from FAMAF, Argentina.
   FAMAF, National University of Córdoba.

Primera Escuela Argentina de GPGPU Computing para Aplicaciones Científicas. (35 h) 2011
   FAMAF, National University of Córdoba.

Language skills

Language:	**Spanish**.
Level:	Lengua madre.

Language:	**English**.
Level:	Advanced (professional working proficiency).
Certification:	*Certificate of Proficiency in English* (Cambridge English Language Assessment)
Institution:	University of Cambridge.

Language:	**German**.
Level:	Intermediate.
Certification:	B1 (CEFR)
Institution:	Goethe-Institut Córdoba, Argentina.

Language:	**Dutch**.
Level:	Beginner (between A1 and A2 of the CEFR)
Institution:	TCP Language Centre, University of Twente.

References

Prof. Fabio Massacci   fabio.massacci@unitn.it
Università di Trento (IT)   http://disi.unitn.it/~massacci/

Prof. Mariëlle Stoelinga   m.i.a.stoelinga@utwente.nl
Universiteit Twente (NL)   https://wwwhome.ewi.utwente.nl/~marielle/

Dr. Nick Oosterhof   nick.oosterhof@ns.nl
Dutch Railways (NL)   https://www.linkedin.com/in/nick-oosterhof-2925a2/

Dr. Inka Locht   inka.locht@ns.nl
Dutch Railways (NL)

Prof. Pedro R. D'Argenio   pedro.dargenio@unc.edu.ar
Universidad Nac. de Córdoba (AR)   https://cs.famaf.unc.edu.ar/~dargenio/

Prof. Holger Hermanns   hermanns@cs.uni-saarland.de
Universität des Saarlandes (DE)   http://depend.cs.uni-sb.de/index.php?id=166

Prof. Joost-Pieter Katoen   katoen@cs.rwth-aachen.de
RWTH Aachen University (DE)   https://moves.rwth-aachen.de/people/katoen/